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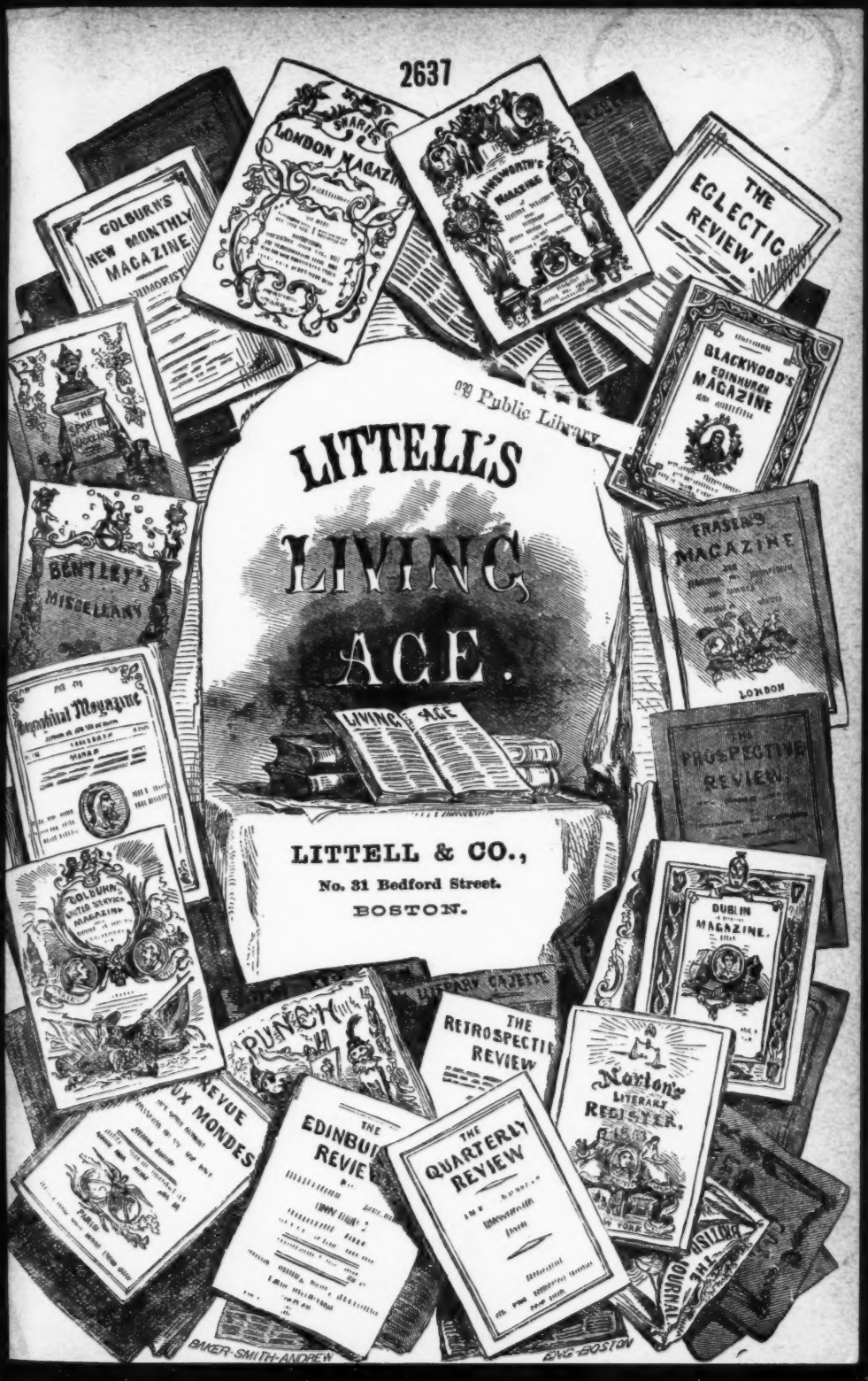
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ADVICE TO A YOUNG BLACKBIRD.

Ah, there you are, let out alone at last,
I've watched your goings on for some days past;
Though you may try to hide your youth by cheek,
I know your age; you left the nest last week.
Come here and let me give you some advice,
It shall be useful, kindly, and concise;
For your new life has jars as well as joys,
And there are cats and catapults and boys.
When on the lawn be vigilant and firm,
And deftly learn to land the unwilling worm;
When times are hard and every lawn is dry,
Give up the usual worm and try the fly;
Feast through the summer; but, when autumn comes,
Abstemious be (but chiefly with my plums),
Thank man in winter for his crumbs and grain,
And, in the summer, praise the Lord for rain.
In nesting-time don't build too near the sod,
Choose a thick holly; and then trust in God;
Get a good mate, with kindly heart, and tail
Managed with grace, not flaunted like a flail.
When you fall out — as will do hens and hubs,
Don't make it known by scolding through the shrubs.
And now about your singing, just a word:
Practise for skill, not merely to be heard;
You ought to have a voice of some repute,
Your father's voice, you know, is like a flute;
Keep your song low and warble from the chest,
A mellow, rich contralto suits you best;
Whate'er you do don't trifle with the air,
But work it out with conscientious care;
"Give yourself airs," but don't "go on the street,"
Or your best passages too oft repeat;
At early morn a cheerful voice maintain,
But in the evening sing your tenderest strain.
Work hard, be true, and for perfection search,
Then in your art you'll take the highest perch.
Think over what I've said: remember that
Whate'er you are —— look out! here comes the cat!

Academy. ELLIOT STOCK.

A COMPARISON.

On o'er the pastures, where the mountain flowers
Starring the sward trim garden beds outshew!
On through sweet pine woods, cross the torrents' flow;
On o'er vast boulder mounds, while still the hours
Make labor lightsome! Far above thee towers,
Unseen as yet, the peak; on o'er the snow!
Nor heedless tread its smoother plain, for lo,
The blue abysses yawn, the avalanche lowers!

Scale yonder beetling cliffs, where now the sun
Beats fiercely, hew sure steps in walls of ice;
What though with toil-worn limb and laboring breath,
Hold bravely on until the height be won.
So runs life's tale: childhood, youth's paradise,
Hard manhood, weary age, the goal of death.

Spectator. H. T. R.

FROM THE "PRIMAVERA" OF RODRIGUES LOBO.

Waters that, pendant from yon dizzy height,
Fall o'er the rocks below in careless play,
From where, tossed up again in clouds of spray
And angry made, you form a fairer sight,
If e'er the selfsame hardness checks your flight
Why so persistent, weary waters, pray,
Since years have undeceived you, and each day
These rocks are rougher, ruder, in their might?
Oh, turn again back through the leafy grove
Where you can freely flow until the sought
For goal be reached and you your wish attain;
But these, alas, are mysteries of love,
For e'en your purpose will avail you nought,
As mine availed not me amid my pain.

Academy. EDGAR PRESTAGE.

From The Nineteenth Century.

RECENT SCIENCE.

I.

THERE is no doubt that diphtheria has lately attained an alarming frequency in Europe. To say nothing of Russia, where the last epidemics had swept away nearly all children in many villages, we find that in Prussia no less than one-sixth to one-fourth part of all children dying in the age of from one to five years succumb to diphtheria;[1] and the same proportion must have lately prevailed in western Europe as well. One fully understands, therefore, the keen interest which is taken at this moment by the general public in the experiments of the French doctors Roux and Yersin, who try to cure diphtheria by means of the blood serum of animals previously vaccinated against that disease. However, the scientific importance of these experiments is even greater than their immediate utilitarian value. Serum-therapy has a direct bearing upon nearly all infectious diseases; and it touches upon some of the most burning questions relative to the fundamental problems of life; while the manner in which the researches have been conducted is such that there is hardly, in the whole domain of modern science, another branch which could better illustrate the best methods of scientific investigation applied to a most complicated subject, or better contribute to the general promotion of scientific methods of thought.

That diphtheria, like tetanus (or lockjaw), with which it has much in common, or like anthrax, cholera, malaria, and so on, is due to an infection of the body by special bacteria is by this time an established fact. Without an infection by either the bacteria discovered by Löffler, or the poisons which they secrete, there is no diphtheria. But it is also known that the powers of different animal species, and even of different individuals, to resist infection vary a great deal, and that they can be weakened or increased by vaccination, so as even to confer full immunity. This being true of nearly all infections, the attention of bacteriologists is chiefly directed now towards finding out what is the cause of the poison-resisting powers of the organism, how they are acquired, and how to strengthen them.

Two years ago E. Metchnikoff's ingenious theory of immunity was analyzed in this review. According to this theory, the organism which has been successful in its struggle against infection owes its recovery to a victory which has been won by its amœba-like white cells, or leucocytes, over the infecting microbes. As soon as poisonous bacteria are introduced into the animal body, the free white cells — *i.e.*, the white corpuscles of the blood and the lymph, and the so-called wandering cells — probably attracted by the secretions of the bacteria, gather in immense numbers at the spot of infection. There they wage a war to the intruders. If they are healthy and numerous, and if the bacteria do not multiply too rapidly, so as to overpower the leucocytes in numbers, the latter absorb the microbes, enveloping them with their protoplasm and rendering them inoffensive. In some places the leucocytes actually digest the microbes — that is, dissolve them and absorb them — thus fully deserving the name of microbe-eaters or phagocytes; in other cases they simply keep them enveloped in their protoplasm, and, without killing them, prevent them from casting spores and multiplying; or else, as it would appear from some recent researches, they carry them away to the liver, the lungs, and partly the spleen, where the intruders gradually decay. Wonderful as these statements are, they are facts and not theories. The leucocytes really come together in their millions at the infected spots, hastening thereto from all parts of the body;[2] and hundreds of microscopical preparations, showing to the eye how the

[1] Professor Behring, Die Geschichte der Diphtherie, mit besonderer Berücksichtigung der Immunitätslehre, Leipzig, 1893.

[2] Their disappearance from the blood immediately after infection has lately been confirmed by several explorers.

leucocytes envelop the microbes with their protoplasm, have been made in the laboratories; many of them have been figured in the works upon the subject.[1] Consequently, the reality of the absorption of the microbes by the leucocytes (the phagocytosis) is now generally recognized, and the importance only of this struggle between two sets of cells, as compared with other possible means of protection against infection is now under discussion.

Other agencies, besides the leucocytes, most probably intervene, and during the last few years a great deal of attention has been given to these agencies. It has become evident that the action of bacteria is very complicated. In some cases the poisoning bacteria must be associated with various species of other micro-organisms, inoffensive in themselves, but probably required to prepare some favorable conditions for the multiplication and the deadly action of the former. Without the aid of their associates the poisoning bacteria may have no effect, as has been proved several times with cholera and typhoid fever, and is well known for tetanus bacilli. Again, the bacteria may simply destroy some cells of the body — this is the way of the malaria parasites, which destroy the red corpuscles of our blood[2] — or they may attack the tissues of some special organs; or they will deprive the cells of the body of the plastic elements, or gases, necessary for their life, and, so to say, starve or suffocate them. But their effect may also be more indirect; they develop, also, what we call, for want of a better knowledge of the subject, some poisons — some living, ferment-like toxines — which affect the fluids of the body, and especially its blood, and, through it, the whole organism. Since Koch discovered his tuberculin, these poisonous products of the bacteria have been studied a great deal; and, although we are very far from a somewhat precise knowledge of their nature, we know, nevertheless, that most toxines, although deprived by filtration of all bacteria and bacteria spores, exert upon the animal body the same deadly effect as the bacteria themselves — they provoke the same disease.[3] And, finally, there is in the animal body another class of ferment-like albumoses, also very imperfectly known, which also develop out of the activity of bacteria, and which seem to meet in the body the effects of the above poisons. The *British Medical Journal* has proposed for them the very good name of defensive proteids.[4] These anti-toxines, whatever their nature may be, undoubtedly develop in the blood, and especially in the serum of animals which have caught certain infectious diseases and have recovered from them; and, consequently, another — that is, a fourth — branch of research has grown up, the explorers of which want to know whether blood altogether, and especially its serum, as well as other liquids secreted by the body, and especially milk, do not possess immunity-conferring, or even curative, properties. This is the branch of bacteriology which interests us most at the present moment, especially as regards the applications of blood serum to the cure of diphtheria.[5]

[1] We are glad to state that Metchnikoff's "Leçons sur la pathologie comparée de l'inflammation" has by this time been translated into English by T. A. Starling and E. H. Starling. Notwithstanding its rather technical title, the reading of this little and suggestive book can safely be recommended to non-specialists.

[2] For all concerning the malaria microbes see the excellent work of Dr. Julius Mannaberg, "Die Malaria-Parasiten, auf Grund fremder und eigener Erfahrung dargestellt," Vienna, 1893.

[3] Besides the researches of Koch and his school into the properties of tuberculin, a wide number of works ought to be named under this head. Such are the studies undertaken by Roux and Widal (at the Institut Pasteur), and Wooldridge in 1888, into the poisons secreted by the diphtheria and the tetanus bacteria; the investigations of Brieger and Fränkel into the poisonous albumines (toxalbumines); and those of E. H. Hankin, Kanthack, and Dr. Sydney Martin into the toxines and the protective anti-toxines.

[4] See E. H. Hankin's "Report on the Conflict between the Organism and the Microbe" in *British Medical Journal*, July 12, 1890; also his review of Behring and Kitasato's work in *Nature*, December 11, 1890, xliii. 121. Indications of the corresponding literature are given in both papers.

[5] Its literature is immense. Indications relative to it will be found in the quoted works and reviews. Buchner's reports to the Hygienic Congresses at London (1891) and Buda-Pesth (this

For many years past Doctors Richet, Héricourt, and Klein, amidst general indifference, have advocated the use of the watery parts of blood — the serum — as a means of protecting animals against infection, and insisted upon its curative properties. However, their opinions passed unnoticed. All that preparatory work concerning the bacterial poisons and the anti-toxines which has just been mentioned had to be done before the importance of the serum could be properly understood and demonstrated. It was therefore only at the end of 1890, when the German doctor Behring and the Japanese bacteriologist Kitasato published the results of their elaborated researches, that the whole matter was put on a firm scientific basis.[1] Modern serum-therapy, as acknowledged over and over again by Roux and all other explorers, dates from these memoirs.

The development of Behring's ideas is extremely interesting, and it admirably illustrates the present aspects of bacteriological research. Rats, as is known, are resistent to several infective diseases, including anthrax. While mice, rabbits, guinea-pigs, sheep, and horned cattle rapidly succumb to an infection of anthrax bacteria ; rats do not catch the disease. This was known years ago, and it had also been remarked, in laboratory experiments, that while anthrax bacteria thrive in the serum of the last-named animals, they rapidly degenerate in the serum of rats.[2] It was natural, therefore, to suppose that the same takes place in the living organisms, and that the resistance of rats and the susceptibility of mice, rabbits, and so on, are due to the different bacteria-killing properties possessed by the serum in these different species. But experiment, directed this way, refused to support the hypothesis. Animals whose blood showed no bactericide properties in the laboratory were found to be immune against certain diseases ; while, on the other hand, animals whose blood destroyed the bacteria in a glass bottle were not always immune. Some experiments were in favor of the hypothesis, but others were dead against it, and there remained nothing but to submit to the verdict, however undesired it was.[3]

These negative results were arrived at at a time when Roux and Yersin, who studied diphtheria, and Kitasato, who worked on tetanus, had succeeded in obtaining, out of the secretions of the respective bacteria, such powerful poisons that it became possible to provoke both diseases by injecting the poisons alone, after all bacteria and their spores had been carefully eliminated from the injected matter. Illness and death evidently resulted in such cases, not from some action of bacteria upon the cells of the animal, but from a general poisoning, whatever that poisoning might be. Accordingly, Behring and Kitasato, and several other bacteriologists, at once began to experiment upon such substances as might paralyze the bacterial poisons, even though they might be unable to kill the bacteria themselves. Various chemicals were tried, and for some time great hopes were entertained as to the chemical treatment. But again the results were utterly disappointing. It appeared that the effects of the chemicals are mostly quite local, and that, to be of any use, they must be applied immediately after the infection takes place. Their practical value is therefore extremely limited.[4]

year) are excellent reviews of the whole question, the more so as Buchner is one of the chief workers in this branch.

[1] Behring and Kitasato, "Ueber das Zustandekommen der Diphtherie-Immunität und der Tetanus-Immunität bei Thieren," in *Deutsche medizinische Wochenschrift*, 1890, 49, p. 1113. Analyzed in *Nature* by Mr. Hankin, December 11, 1890, xliii. 121.

[2] I follow in this sketch Behring's own description of the evolution of his ideas, as given in his introduction to his and Kitasato's memoirs, "Die Blutserumtherapie bei Diphtherie und Tetanus," in Koch and Flügge's *Zeitschrift für Hygiene und Infectionskrankheiten*, 1892, xii. 1-10.

[3] A long series of such experiments was made in Bouchard's laboratory; so also by Behring and Nissen.

[4] The limited effect of chemicals will be better illustrated by the following: Dr. Calmette, the chief of the Bacteriological Institute of Saigon, having once received from a locality infested by cobra snakes a barrel containing fourteen living specimens of the snake, utilized this opportunity for studying the means of combating the deadly

Nevertheless an important point was won by such researches. Behring and Kitasato found, to their astonishment, that if the spread of tetanus in an animal had been stopped by any sort of chemical treatment, the blood of that animal, although it was unable to kill the *bacteria* of tetanus, paralyzed the *poisons* evolved by the bacteria. The animal was rendered immune against infection; and when the two doctors attempted to *cure* tetanus by means of the serum of such blood, they at once obtained results which went far beyond their expectations. To quote but one instance: several mice were dying from inoculated tetanus, when an injection of the serum of an immune rabbit was tried upon one of them. Improvement became apparent at once, and it was followed by recovery, while the other mice died in a few hours. The cure for tetanus was thus found, and this was what Behring and Kitasato announced in their epoch-making memoir in December, 1890.

But now that the final aim seemed to have been reached, new difficulties arose. The first successes were not always confirmed by subsequent experiments, and, in proportion as the field of research was widened, failures became more and more frequent. Then it was much more difficult to obtain a curative serum for diphtheria cases than it was for tetanus. Moreover, large quantities of serum were required for the serum cure, and they could be obtained only by conferring immunity against diphtheria on larger animals very susceptible to diphtheria — a feat which was found by no means easy to accomplish. Happily enough, the two explorers made no secret of their discoveries, so that new and easier methods of vaccination were sought for and discovered, especially by Roux and Yersin.

It would not be possible to relate here the details of these memorable researches.[1] Sufficient to say that gradually the following method was elaborated, and that it proved successful for big animals as well. Instead of introducing a deadly virus, and then trying to cure it by chemicals, an *attenuated* diphtheria (or tetanus) poison was used for vaccination — all bacteria and their spores having been removed by filtration from the vaccinating liquid, and the morbid properties of the poison itself having been reduced by the addition of certain chemicals.[2] This attenuated poison was injected into a quite sound sheep (or horse) in such limited quantities as to obtain but a very feeble reaction of fever; and the injections were repeated until the animal was accustomed, so to say, to the poison, and no more fever was provoked by subsequent injections. Then stronger doses, up to three and six cubic inches of the attenuated poison, were resorted to; and when they also had no marked effect, an injection of the most virulent diphtheria poison, such as would kill outright an untrained sheep, was attempted. If it did not provoke diphtheria, the sheep or horse was considered immune, and the serum of its blood could be used to cure diphtheria in other animals.[3] This method was gradually perfected, and it was discov-

poison. He experimented with all sorts of chemicals. It appeared, however, that although permanganate of potassium at once destroys the cobra poison in a glass tube, and precipitates it, it has but little effect in the animal body unless it is introduced into the wound immediately after, or simultaneously with, the inoculation of the poison. Otherwise the latter rapidly spreads through the body, and can be paralyzed no more either by the permanganate or by ammonia. Chloride of gold is but little more efficacious. If the spreading of the poison is slackened by ligatures, and injections of chloride of gold are made all round the wound, and *on the way of the poison from the wound to the central parts of the body*, there are some chances of recovery; but the whole must be done very quickly, in order to prevent the spreading of the poison ("Observations expérimentales du Venin de *Naja tripudians* ou *Cobra capel*," in *Annales de l'Institut Pasteur*, 1892, vi. 160).

[1] The reading of the chief original papers, namely, by Behring and Kitasato, in the *Zeitschrift für Hygiene* (1892, xii. 1–81), and by E. Roux and L. Vaillard in the *Annales de l'Institut Pasteur* (February, 1893, vii. 64–140), can be recommended to non-specialists as well as others.

[2] Roux prefers iodine, while the German explorers prefer iodine trichloride, or a chloride of gold and sodium. Many other chemicals, including peroxide of hydrogen, were experimented with before these three were chosen.

[3] Behring's Die Geschichte der Diphtherie, pp. 160–165.

ered by Roux that the serum need not be drawn each time afresh. It may be desiccated, and kept for a long time in such state without losing its properties.

The curative effects of such serum are really wonderful. A guinea-pig usually dies from inoculated diphtheria in thirty-six to forty-eight hours. But an injection of a very small quantity of serum (one five-thousandth part of the weight of the patient), if it be made a quarter of an hour after the inoculation of the poison, prevents the appearance of the disease. If the treatment begins at a later period, say eight hours after the inoculation, ten times more serum is required. Even twenty-four hours after the infection takes place the animal can be saved by an injection of serum attaining one one-hundredth part of the animal's weight. Its blood is renewed ; it acquires new forces, and it destroys the poisons of diphtheria which were rapidly bringing the disease to a fatal end.[1] With tetanus, injections of serum are effective even in a more advanced stage.

Moreover, as shown by Kitasato and his colleagues,[2] the same method is applicable to Asiatic cholera, erysipelas, hog-cholera, and anthrax. Immunity at least, or, more correctly, a resistance to poisoning, is easily obtained for these diseases as well ; and in cholera immunity is conferred so rapidly — in twenty-four hours — that the treatment has very much the characters of a real cure. A wide field is thus opened for most promising discoveries.

In how far the serum treatment may be relied upon for man is still a question to be solved by experiment, and upon which Roux, Behring, Kitasato, Ehrlich, and all the above-named explorers, as well as Tizzoni and Cattani in Italy, are now busy at work. The brilliant successes announced from time to time in the daily papers must certainly be received with caution. But in view of the undoubted, though not always infallible, successes obtained with animals, and the fair proportion of successful treatment of men, we can be hopeful. In some cases the cures have been most remarkable. Moreover, we learn from statistics which reach us as we write these lines that Roux at Paris has obtained seventy-four per cent. of cures in three hundred ascertained cases of diphtheria, already treated by the serum ; and that Professor Ehrlich at Berlin has had eighty-five per cent. of recoveries in the one hundred and sixty-three cases treated by the new method. There were only two failures out of the seventy-two cases in which serum was injected during the first two days of the disease.[3] Such results are more than reassuring.

The theoretical value of these investigations is self-evident. Important points have been won, and new and broader vistas have been opened. Metchnikoff's theory of immunity has certainly not been overthrown by the new discoveries. On the contrary, the part played by the phagocytes in the struggle against infection is fully recognized even by such promoters of the serum theory as Buchner and Roux. It has been proved, moreover, that an injection of an antitoxic serum provokes a marked increase in the numbers of the leucocytes in blood,[4] and it appears probable[5] that the leucocytes

[1] Behring and Wernicke, "Ueber Immunisirung und Heilung von Versuchsthieren bei der Diphtherie," in *Zeitschrift für Hygiene*, 1892, xii. 10–44 ; also Behring's "Geschichte der Diphtherie," p. 184.

[2] S. Kitasato, L. Brieger, and A. Wassermann, "Ueber Immunität und Giftfestigung," in *Zeitschrift für Hygiene*, 1892, xii. 137–182. For immunity through milk, P. Ehrlich, in same volume, p. 183, where copious bibliographical indications are given. Kitasato attenuates the bacterial poisons by cultivating the bacteria in preparations obtained from the thymus gland. His researches thus join hands with the most remarkable therapeutic results obtained by Brown-Séquard and D'Arsonval, and they tread upon the ground which has been so well reviewed lately by Professor Schäfer in his presidential address before the British Association at Oxford.

[3] M. A. Ruffer, in *Nature*, November 1, 1894, li. 18.

[4] Roux and Vaillard recognize the fact in the above-quoted memoir, p. 91.

[5] Mademoiselle C. Everard, J. Denmoor, and J. Massart, "Sur les Modifications des Leucocytes," in *Annales de l'Institut Pasteur*, 1893, vii. 187–194. See also Metchnikoff's fifth memoir on immunity in the same volume.

of a vaccinated animal differ from those of other individuals of the same species in being capable of more rapidly attaining their stage of full development, when they are more active in absorbing microbes. But it also becomes more and more apparent that the phagocyte theory will require some further extension. Perhaps, if the views developed by Héricourt upon infectious disease altogether[1] prevail in science, it will be found that phagocytosis and the struggle between the bacterial poisons and the anti-toxines of the serum correspond to the two different phases which, according to Héricourt, are marked in each infectious disease. But we must first learn what the toxines and the anti-toxines are. Up till now we can only say that they are living matter, and that they must be considered as ferment-like substances; but we do not know what is the reason of their action upon each other, and bacteriologists have not yet succeeded in separating them from each other in the laboratory. Perhaps the modern researches into the structure of the cell, which prove that each cell is a world in itself, will throw some light upon this difficult subject, and some day we may learn that the toxines and the anti-toxines belong to the category of those component self-reproducing elements of the cell which have been named *pangenes* by De Vries.

II.

THE destructive earthquakes which have lately visited Italy, Greece, Turkey, and Japan have again brought to the front the long since debated question as to the probable origin of those grand trepidations of the soil. Great divergence of opinion undoubtedly prevails still among geologists; but some accord begins also to be established upon the chief points at issue, so that the main features of an earthquake theory can already be delineated.

A really scientific study of earthquakes is of relatively recent origin. It may be said that it dates from the great catastrophe at Naples in 1857, when H. R. Mallet worked out, in his classical report,[2] the methods of investigation of earthquakes, and when Palmieri, establishing his seismometric observatory on the slopes of Vesuvius, attracted general attention to the necessity of special instruments for measuring the movements of the soil. Each earthquake of importance has been carefully investigated since, and the spot, or the line, from which the disturbance originated, as well as the depth at which it lay below the surface, have been carefully determined in each case. In many places the tremors of the soil are now carefully measured and registered by means of special instruments; and although it was found very difficult to devise an instrument which would accurately record the movements of the soil, the chief difficulties have gradually been overcome, and the records of our seismometers and seismographs, properly interpreted, give already a good idea of the waves which spread in the soil. As to the delicacy of the modern tools used for detecting the slightest tremors, it is sufficient to say that by means of the new seismometrograph established at the Collegio Romano it was possible to observe at Rome not only the earthquakes which took place in Greece, India, and Turkestan, but also to see, on March 22 last, three distinct waves coming from three distinct shocks in Japan. They had travelled over an enormous distance — nearly one earth-quadrant — at a speed of about twenty-seven hundred and fifty yards in the second, and yet were visible in the tracings by the instrument. But the new bifilar pendulum devised this year by Mr. Horace Darwin is even still more promising; it can record and measure a tilt of the earth's surface of less than one three-hundredth part of a second[3] — that is, a change of level which would occur if a line one mile long were lifted by one-

[1] *Revue Scientifique*, November 15, 1884, xxxiv. 619.

[2] Great Neapolitan Earthquake of 1857, two vols. London, 1862.

[3] C. Davison, in *Nature*, July 12, 1894, l. 249.

thousandth part of an inch at one of its extremities. And, finally, direct experiment is now called in to the aid of the young science, and artificial earthquakes having been provoked both by explosions of mines and by the fall of heavy masses of iron, their effects upon delicate instruments have been carefully studied. The tools of the seismologist thus attain a high degree of perfection.

In studying the distribution of earthquakes upon the surface of the globe the annals of all countries have been ransacked, and monumental catalogues have been compiled by H. R. Mallet, Alexis Perrey, and Fuchs, and, quite lately, by Orloff and Mushketoff for Russia and the adjoining lands of Asia. Special centres have also grown up for a detailed study of earthquakes, in south Italy, Greece, and Japan,[1] especially in Japan — the land of earthquakes and earthquake studies — where invaluable data are collected by sending out all over the country scores of thousands of post-cards, which are returned every week to the Seismological Institute, with notices of the shocks experienced at each spot.

There is also no lack of investigations relative to the distribution of earthquakes in time, their supposed periodicity, and their possible connection with the seasons of the year, the relative positions of sun and moon, the atmospheric pressure, the electric earth-currents, and so on; and if the expectations of Falb and Perrey, who have tried to predict earthquakes, have not been fulfilled, we may still hope that warnings similar to those which are issued for coal-mine explosions will some day be possible. One fact of importance appears, at any rate, with certainty from these investigations — namely, that earthquakes are decidedly more frequent during the winter months than during the summer, and that their frequency stands in some not yet fully determined connection with atmospheric pressure.[2] Of course this does not mean that cold seasons, or a high atmospheric pressure, or even the supposed tidal action of the sun and the moon upon the elastic earth's crust, may be considered as causes of earthquakes. They must be taken only as additional impulses aiding to break an already unstable equilibrium which originates, according to the now prevailing views, from the dislocations of the strata themselves, chiefly due to aqueous causes.

The study of earthquakes thus stands now on a firm scientific basis. As to their causes, current opinions are undergoing just now a deep modification. The theory of earthquake origin which has till lately prevailed in science, and which had for it the authority of Humboldt and Leopold Buch, is well known. Earthquakes and volcanic eruptions were considered as effects of a common cause, the never-ceasing reaction of the hot and molten interior of the earth upon its thin solid crust. When water, percolating the rocks or running down their fissures, reaches the depths at which the temperature is so high that rocks and metals are maintained in a liquid state, steam is evolved under a formidable pressure, and, together with the gases originated from the molten mass itself, it accumulates in the subterranean cavities. Rows of volcanoes rise along gigantic trends which are opened in the earth's crust, and they act as so many safety-valves for the escape of the gases and steam; but if one of these valves be obstructed for some reason, the pressure of the

[1] The *Transactions of the Seismological Society of Japan*, named now the *Seismological Journal of Japan* (edited by J. Milne), are full of the best information relative to earthquakes altogether.

[2] Sjögren, "Om jordkorpans sammanpressning under atmosfertrycket," in *Ofversigt af Vetenskaps Akademiens Förhandlingar*, 1888, ii. 131, has lately promoted the idea that the compression of the strata by high pressure favors the outbursts of subterranean gases. R. Langenbeck holds a similar opinion (in Gerland's Geographische Abhandlungen aus Elsass-Lothringen, 1892, Heft i.). Günther (Beiträge zur Geophysik, Bd. ii. 70) has lately paid a good deal of attention to the subject, and came to approve of Sjögren's idea (in Naturwissenschaftliche Rundschau, ix. 20). For all concerning earthquakes Professor J. Milne's excellent little volume of the "International Science Series," and S. Günther's "Lehrbuch der Geophysik" (2 vols. Stuttgart, 1884), will be found trustworthy guides.

gases grows, until they open a passage through the solid crust, bringing the rocks into a formidable commotion.

The theory was grand. It brought into causal connection a wide range of volcanic and seismic phenomena; it inspired research. Who does not remember the beautiful lines devoted by Humboldt in his "Cosmos" to this subject? However, even at the time these lines were written the theory was beginning to inspire serious doubts. Was not the cause too grand in comparison with its results? Would not the molten nucleus break the thin crust to atoms if it stood in such free intercourse with the atmosphere? Local hearths of chemical activity would do as well to explain volcanic action, and local disturbances in the superficial strata would perfectly well explain the greater number of earthquakes. In fact, when we know that the mere fall of the steam-hammer in Krupp's gun factory shakes the houses and their windows for several miles round;[1] that the explosion of a mine loaded with gunpowder or dynamite is felt many miles off; and that the mere trampling of a holiday crowd is reported to the astronomers of Greenwich by the behavior of their levels, we feel disinclined to appeal to the molten nucleus, and we look for causes nearer at hand.

Gradually, the very existence of the molten nucleus of our planet became more and more problematic. Already the mathematical investigations of Fourier and Poisson had shown that, owing to our very imperfect knowledge of the physical aspects of the question, we are reduced to mere conjectures as regards the state of the inner parts of our globe.[2] Later on, the admirable investigations of Sir William Thomson, G. H. Darwin, Mellard Reade, Osmond Fisher, R. S. Woodward, and others rendered the existence of a molten nucleus surrounded by a thin solid crust less and less probable. And the geologist had to conclude that, so long as physics would not supply more reliable data for mathematical investigation, he had better leave the question as to the physical state of the inner parts of the earth unsolved, and study the dynamic processes which are going on in the superficial layers of the planet. The more so as the subsidence of strata undermined by water; the disturbances of equilibrium which result from the transport of immense masses of matter by the rivers, and the accumulation of deposits in their deltas; the side pressures so well illustrated by the folding of the strata; the chemical processes which must go on in the rocks at relatively small depths; and the forces originating in the crystallization of rocks, are agencies largely sufficient to explain both the activity of volcanoes and the most severe subterranean shocks.

Research was accordingly directed towards a study of the local causes which might have given origin to each separate earthquake. There is, of course, a number of earthquakes directly due to volcanic causes; but these, as already indicated by Humboldt, are always limited in their areas and are the minority. As to the greater number, their causes must be sought for in local disturbances of the rocky strata. Everywhere there are softer strata which are disintegrated by water between the rocky layers above and beneath them. One day or the other they must yield; and when they do yield, their subsidence, or the gliding of the upper strata upon a softened intermediate layer, must result in an earthquake. And when the geologist looks for a local cause of an earthquake, he finds that some such disturbance has really taken place. Such was the case in the great Naples catastrophe of 1857; such was again the case in the Irkutsk earthquake of 1861–62, when all information pointed to the delta of the Selenga, where a large area subsided, and one hundred and forty square miles of land were covered with

[1] The fact had been indicated by Mohr in his "Geschichte der Erde" (Bonn, 1875), which was so much scoffed at at the time of its appearance for its pronounced Neptunist ideas.

[2] For a capital review of the mathematical theories of the earth, see R. S. Woodward's presidential address in *American Journal of Science*, 1889, xxxviii. 337 *seq.*

the waters of Lake Baikal to a maximum depth of seven feet.[1] The great earthquake of Middle Japan in the year 1891 had again the same character. It was found that a rent was opened in the superficial strata for a length of more than forty miles, and that on one side of the rent the strata had subsided by as much as twenty feet in the places of maximum subsidence. And all indications agreed in pointing to this rent as the line from which the earthquake waves had proceeded, so as to leave no doubt as to the subsidence being the cause, and not the consequence, of the earthquake.[2] Moreover, in this case, as in all others, after the sudden subsidence had provoked several severe shocks, thousands of smaller shocks, proceeding from the same locality, continued to be noticed for a year or so, until a succession of smaller subsidences had brought the displaced mass to a rest. The great earthquakes which affected in April last the north-eastern region of continental Greece had the same character. A great fissure thirty-five miles long was opened, and on one side of the fissure the Plain of Atalante was lowered and slightly shifted towards the north-west;[3] and similar, although submarine, changes of level were observed during the earthquakes which visited Zante and the Gulf of Corinth in 1873, 1886–90, and April, 1893.[4]

For almost every great earthquake which has taken place during the last thirty years the cause was found in local dislocations and subsidences. But while our knowledge of the local causes was thus progressing, the part which belongs to earthquakes in the general life of the planet was lost sight of. Some broader generalizations, the necessity of which Humboldt insisted upon, were required, and they were given in the epoch-making work of Suess, "The Face of the Earth."[5] The "local dislocation" theory is fully endorsed by Suess; but these dislocations themselves are treated as but separate instances of the activity of those "tectonic" or building forces which continually re-model the earth's surface, create the abysses of the oceans and the depressions of the continents, and lift up the highest mountains. Starting from the idea that the cooling of the globe results in a steady decrease of its diameter, and consequently in a continuous shrinking and shrivelling of its outer strata, Suess endeavored to show how this process would work in producing the leading features of the earth's surface. He described how large areas have been, and are still, sinking bodily, producing the great faults which intersect our rocky formations; how semicircular depressions arise on the borders of the highlands; and how the lateral pressures developed during the shrinking of the outer layers result in lateral pressures which fold the strata and lift them into mountain chains. The earthquakes under this broad conception of "geo-tectonics" appear as simple trepidations of the soil by which the shrinking of the crust and mountain-building processes are necessarily accompanied.

Kant had already remarked that most earthquakes take place on the seaboard. Modern research fully confirms this view, and goes a step further. It maintains that by far the greatest number of earthquakes — perhaps ninety per cent., as Professor Milne says — originate beneath the sea, where the rocks, under the superincumbent hydrostatic pressure, are continuously saturated with moisture, and can the easier be displaced. In fact, in nearly every earthquake in Japan, the centre of disturbance of which could be determined, it was found to lay a short distance off the eastern coast of Nippon.

[1] Orloff and Mushketoff's Catalogue, St. Petersburg, 1893.

[2] B. Kotô, "On the Cause of the Great Earthquake in Middle Japan in the year 1891," in *Journal of the College of Science*, Tokyo, 1893.

[3] S. A. Papavasiliore, "On the Earthquake of Locrio of April, 1894," in *Comptes Rendus*, 1894, cxix. 112, 380; analyzed in *Nature*, l. 607.

[4] W. G. Forster, in *Mediterranean Naturalist*, April, 1893; analyzed in *Nature*, April 27, 1893, xlvii. 620.

[5] Ed. Suess, "Das Antlitz der Erde," 2 vols. Prague, 1885. This work of first importance has not yet been translated into English.

The same is true of the earthquakes which have lately visited Greece, as illustrated by the breakages of submarine cables, which undoubtedly indicate that considerable changes of level have taken place at the bottom of the sea.[1] And the same is true, again, of the Constantinople earthquake of July last, which had its centre of disturbance in the Sea of Marmara, at a short distance from San Stefano.[2] In short, it may be taken as a fact that a great number of earthquakes, to say nothing of the sea-tremors, which also are numerous,[3] originate at the sea-bottom, near the seacoast.

However, not all seacoasts are equally liable to be visited by earthquakes. The flat lands of subarctic Asia, which gradually merge into the shallow Arctic Ocean, are seldom disturbed. A steep slope of the sea-bottom itself, or of an elevated land towards a deep sea, is a necessary condition for both earthquakes and sustained volcanic action. The eastern coasts of the Japanese archipelago, which face the till lately unfathomed abysses of the Northern Pacific, and the abrupt slope of the Chilian coast of South America, are well known instances in point.

The deep depressions of the bottom of the east Mediterranean, where a depth of over two thousand fathoms is found within twenty miles from the island of Rhodes; the western coast of Southern Greece, facing the twenty-one hundred and seventy fathoms deep abyss of the Ionian Sea which separates it from Sicilia; the Neapolitan coast, separated by but a hundred miles from the two thousand fathoms depth of the Tyrrhenian Sea; and so on — all these facts enable geologists to formulate another law, namely, that steep slopes, either from the land to the sea or of the sea-bottom itself, are another condition for frequent earthquakes.

But even in this form the law would not be complete, as it would not include the disturbed regions of the continents; and it is most remarkable that, when worded accordingly, it applies to continents also. In the very heart of Asia there are two regions where earthquakes are especially frequent, and both of them lie along the steep north-western border of the Great Plateau of Central Asia, where it abruptly falls from the heights of the Tian Shan to Lake Issyk-kul, and from the heights of the Khamar-daban (about eighty-five hundred feet high) to the seven hundred and fifty fathoms deep Lake Baikal. A third depression of the same kind — also a hearth of earthquakes — is situated on the north-east border of the plateau of Persia and Armenia, where the fifteen thousand nine hundred feet high Savelan rises over the deepest parts of the Caspian Sea, marked by the five hundred fathoms line; while farther west we have the depression of Vienna, lodged between the north-eastern Alps and the north-western Carpathians, which has been so well described by Suess as another centre of earthquakes. Moreover, the three first-named depressions, like the so much disturbed Gulf of Tokyo, or the Bay of Arauco in South America, are semicircular depressions, carved out in the edge of the highlands; and this further confirms the above-mentioned views of Suess.

However, a further step seems to be required in the development of the hypothesis. The most severe earthquakes undoubtedly take place on the borders of high plateaus, whether these plateaus slope towards the ocean, or whether they rise over flat lowlands surrounding them. But all plateaus are fringed by border-ridges, which gently rise over their elevated surfaces all along their edges, as well as on the edges of the separate terraces which are so frequent in the plateaus of Asia and America. This feature is too general to be merely accidental, although

[1] W. G. Forster, "Earthquake Origin," in *Transactions of the Seismological Society of Japan*, Yokohama, 1890, xv. 74, 77.

[2] Charles Davison, in *Nature*, September 6, 1894, l. 450.

[3] See E. Rudolph's monograph of the same in Gerland's "Beiträge zur Geophysik," Stuttgart, 1887, Bd. i. 133.

it has hitherto remained quite unexplained. It is therefore possible to suppose that the subsidences which take place, chiefly along the borders of the plateaus, must have a double effect — that of lowering the levels of the surrounding lowlands or plains (or of the adjoining sea-bottom), and of lifting up at the same time the tops of the inclined strata; this process, repeated for ages, resulting in the formation of the border-ridges, which are a necessary accompaniment to all plateaus of the Old and the New World. And as these border-ridges mostly are, or have been in recent geological times, the seats of intense volcanic activity, we see that earthquakes and mountain-building are thus brought again into connection. But this hypothesis, which I venture to add as a further extension of Suess's views, lands us on a new domain — the origin of mountains — which may be better treated separately on some future occasion

III.

GREAT hopes have been revived again among aeronauts by the experimental flights of Dr. Lilienthal in Germany, and the partial successes obtained with their flying-machines by Messrs. Maxim and Phillips in this country, and Mr. Hargrave in Australia. For more than a half-century inventors in aeronautics have been treated as foolish dreamers, and no later than two years ago an American professor who wanted to address his students on the subject of mechanical aviation felt it necessary to seriously beg his audience not to interpret his choice of the subject as a token of declining mental faculties. But, happily enough, these dark times are over, and aeronautics is becoming a regular department of scientific research. The general revival of science which we witnessed in the early sixties has given new life to this branch of research, and we have now an excellent scientific literature devoted to the subject, several aeronautic societies (one in Great Britain) which are doing excellent work, and several reviews in the pages of which aeronautics is discussed in a scientific spirit.[1]

The services rendered by balloons during the last Siege of Paris are well known, and since that time steady progress has been achieved both in the mode of construction of balloons and the art of aerial navigation.[2]

By taking advantage of the different directions of wind at different heights, which begin to be better known, and may be ascertained by means of pilot balloons, the navigator to some extent chooses his own direction; and with the new anchors and guide-ropes landing, which is the most dangerous part of ballooning, has been so much simplified that balloon trips are now as safe as any other kind of sport. For meteorology the balloon is a precious aid, and a good deal has been learned from the aeronauts about temperature and electricity in cloudland; while unmanned balloons, provided with self-registering instruments, as has been found by M. Hermite, can bring us down the most precious information from those highest strata of the atmosphere in which Mr. Glaisher nearly lost his life.

The idea of adding a propeller to a balloon, and thus enabling it to navigate close to, or even against, the wind, is certainly not new — Girard had already realized it in 1852 — but the practical application of his idea had to contend with many technical difficulties. The deformation of the balloon, which takes place as soon as it begins to progress against the wind instead of being carried with it, had to be prevented; a light but powerful motor had to be devised under the limitation of employing no fire for it; and a number of minor obstacles had to be over-

[1] *L'Aéronaute* is published at Paris since 1869. The *Zeitschrift für Luftschiffahrt und Physik der Atmosphäre* is a sister review to the *Zeitschrift für Meteorologie*, and is published by the German and Austrian Aeronautic Societies. A new review, the *Aëronaut*, has been started this year in America. And so on.

[2] For the technical part of the subject and the succession of invention, see the new book of Mr. Chanute, "Progress in Flying Machines," New York, 1894. Also his address before the Congress of Aeronautics at Chicago.

come. Accordingly, although propelled balloons are now the pets of the ministries of war in the big States, and money is freely spent upon them, the advance is still very slow. The greatest speed ever attained by the French officers Renard and Krebs with their cigar-shaped balloon, propelled by a storage-battery motor, was only fourteen miles to the hour. True, that even with this modest speed the balloon could be navigated in a feeble breeze, so as to return to its starting-point, after having described a triangular route; but in order to brave the wind a speed of fifty miles is required, and all that the French officers expect from their new balloon is a speed of twenty-five miles, which will enable it only to take tacks in a moderately fresh breeze.[1] Moreover, there being but little hope of discovering a gas the density of which would be still smaller than that of hydrogen, the dimensions of a propelled balloon must remain very great, in proportion to the useful weight it can carry. The new French balloon (as remarked by Mr. Chanute) will be of the size of a river steamer, and yet it will hardly carry more than four passengers; and a further increase of size would be of little avail, in proportion to the cost of the ship. Consequently, scientific research and invention are now directed more and more towards the flying-machine, which, being much heavier than an equal volume of air, will find in its very density and inertia the means of contending against the currents of air.

We have under our very eyes a most perfect flying-machine — the bird — and we have only to study, from a physical point of view, the laws of its flight, in order to find out the laws which must guide us in our schemes. This is what science has tried to do ever since the time of Leonardo da Vinci. But, owing to a want of interest in such researches in the general public, the scientist had hardly completed his work ere it was forgotten. The wonderful observations and physical reasonings and experiments of Leonardo da Vinci had to be re-discovered a few years ago.[2] Even the admirable work of Borelli, who wrote on the flight of birds in 1680, and the very valuable researches of Silberschlag, published in 1783,[3] were little known; nay, even the work of Cayley, which dates from 1796, had fallen into oblivion. Modern science had thus to begin anew, and it began by dismissing, first, certain prejudices which had taken hold of most minds.

One of these prejudices was to believe that the warm gases contained in the cavities of the bird's body and its quills render it lighter than an equal volume of air. Every one can, however, calculate how insignificant the effect of that warm air must be;[4] and every one knows that a bird which has been wounded on the wing falls at once to the ground. This prejudice could easily be discarded; but another, as to the immense force which the bird is supposed to develop during its flight, is much more difficult to get rid of. No amount of evidence, borrowed from what every one can verify by dissecting the muscles of a bird, or by observing the ease with which it flies, could overthrow that very common error, supported by the most fallacious calculations of a French mathematician made in the early part of this century.[5] It took Professor S. Langley in America nearly four years of careful experiments to show how erroneous were both those calculations and the data upon which they were based.[6]

[1] It is two hundred and fifteen feet long, and forty feet in diameter. The motor, forty-five horse-power, will weigh, with fuel for ten hours, thirty-four hundred pounds.

[2] Amans, "La Physiologie du Vol d'après Léonard de Vinci," in *Revue Scientifique*, mai 28, 1892, xlix. 687.

[3] Schriften der Berliner Gesellschaft der Naturfreunde, Bd. ii. 1781–1784.

[4] Its effect can counteract but one fifty-thousandth part of the weight of the bird (Marey, Le Vol des Oiseaux, p. 287).

[5] Navier, (Mémoires de l'Institut, ii. 1829) maintained that in order to sustain itself in the air a swallow spends a force of one-seventeenth of a horse-power. Langley found that force fifty times smaller. Even the calculations of Babinet, a supporter of aviation, were quite erroneous, as shown by Marey (Le Vol des Oiseaux, p. 328).

[6] S. P. Langley, in Smithsonian Contributions to

Now we can at last take it as granted that, although the energy spent by birds in sustaining themselves in the air varies a great deal according to their shapes and manners of flight, it is less than one one-hundredth to two one-hundredths of one horse-power for each two pounds of body weight. And, as art has already succeeded in producing small prime motors whose weight does not exceed ten pounds per horse-power, one sees at once that the problem to be solved by the flying-machine offers no mechanical impossibility, provided we learn to utilize the energy of our motor as well as the birds utilize their forces.

The next step to be made is, accordingly, to learn from the birds how best to utilize the force of a motor, and therefore to study the mechanical details of birds' flight. Science has done this well, and we have already most excellent guides for this part of the problem in the works of the Duke of Argyll, Mr. Pettigrew, Mouillard, and the fundamental work of Marey (Le Vol des Oiseaux), in which last all such problems have been treated with the aid of instantaneous photographs, taken at intervals of small fractions of a second, not to speak of many others, each of which contains some valuable information.[1] It would be impossible to describe here in a few words, and without the aid of drawings, the admirable mechanism by which the bird drives the air with its wings (rigid at the front edge and flexible at the back), compresses it, and has only to progress forward in order to sustain itself in the air in spite of the action of gravitation. This must be read in the above-named works and seen on Marey's photographs. But what must be said is, that a continuous rotatory movement being more advantageous in a machine than a mechanism which would be an imitation of the flapping of the wings, the best form to be given to a screw-propeller which has to act in the air was indicated by such investigations. It was found already by Leonardo da Vinci, and worked out by Cayley in 1796. It has been lately studied experimentally by several physicists, meteorologists, and inventors — all experiments proving the considerable lifting powers of a screw-propeller in the air. And we have now a direct proof of these powers in Maxim's machine. His propeller, which rotates in a medium having such a small density as air has, communicates nevertheless to the heavy machine with its motor, aeroplane, and a dozen passengers, a horizontal speed of nearly forty miles in the hour. Half the problem is thus solved, because, as shall presently be shown, a great horizontal speed is the first condition of aviation.

We all know, indeed, that most birds, before they can rise in the air, must acquire a certain horizontal speed. Many good flyers can be kept prisoners in an open small yard surrounded by walls twenty feet high, or even on a small open pond surrounded by low but grassy shores, upon which the bird cannot take the necessary run.[2] But once a bird has acquired this speed — and it mostly acquires it by running against the wind — it flies with a wonderful ease; its spread wings and its speed sustain it. Once in motion, the swallow and many other birds will fly any amount of time, hardly using at all their wings for flapping.

Knowledge, 1891, p. 801; and *American Journal of Science*, November, 1891. Also Lord Rayleigh's discussion of the same in *Nature*, December 3, 1891 (xlv. 108), where indications to the works of Mr. Wenham and Mr. W. Froude will be found.

[1] The chapter devoted by the Duke of Argyll, in his "Reign of Law" (first edition, 1866), to the flight of birds is a masterly work, based upon his and his father's observations, and imbued with a thorough knowledge of nature. The same qualities will be found in the more exhaustive works of Mr. Pettigrew (Animal Locomotion . . . with a Dissertation on Aeronautics, London, 1873) and Mouillard (L'Empire de l'Air: Essai d'Ornithologie appliquée à l'Aviation, Paris, 1881); while the large work of Marey (Physiologie de la Locomotion Le Vol des Oiseaux, Paris, 1890, which must not be confounded with his earlier work) is an exhaustive treatise, based upon observations made with the aid of chronophotography. Some of the earlier works are already named. See also Lilienthal's "Der Vogelflug als Grunalage der Fliegekunst," Berlin, 1889; T. d'Esterno, "Du Vol des Oiseaux," Paris, 1864; Goupil, "La locomotion aérienne," Charleville, 1884, etc., each of which contains valuable observations.

[2] Mouillard (L'Empire de l'Air) has made the experiment with *Procellaria*.

These observations, supported by a number of theoretical investigations by Wenham, Froude, Langley, and others, into the resistance of the air, naturally suggested to inventors the idea of the aeroplane — that is, of a thin, rigid surface, inclined by very few degrees (not more than five) to the horizon, and moving horizontally, edge forward. The particles of air which strike the surface under a certain angle spend part of their energies in lifting it, and this lifting power, as foreseen by experimenters and lately supported theoretically by Lord Kelvin, is very much greater than was supposed.[1] A great number of experiments have already been made to measure the lifting powers of different surfaces placed under different angles of inclination and moving at different speeds, especially by Professor Langley; but if there remain some doubts as to the correctness of the result, Maxim's machine should dispel them. Those who have travelled on its platform unanimously maintain that it hardly touches the ground when it is launched at a speed of nearly forty miles, and that, were it not prevented from rising, it would do so, as soon as its speed, or the aggregate surface of its aeroplanes were slightly increased.

To be lifted in the air, and to move in it in a horizontal direction, is, however, one part only of the problem. The other is to maintain equilibrium, which is continually modified by the continually changing pressure of air upon the different parts of the aeroplane or the superposed smaller aeroplanes. The bird feels the changes of pressure on its wings, and gently alters their position, in the same way as the bicyclist feels the slight alterations of equilibrium and changes accordingly the relative positions of his two wheels. But a flying-machine must accomplish this automatically; and before this is achieved, some better acquaintance with the minute details of the art of flying will necessarily be required. This is what gives an especial interest to the flights which Otto Lilienthal has performed in Germany.[2] He adjusts to his body a pair of moderate-sized concave wings, and after having taken a run down a gently sloping hill, always against the wind, he is soon lifted in the air. Floating at a certain height over the ground, against the wind, he glides down a gently sloping line without ever attempting to flap with the wings, and he lands some one hundred to three hundred yards (occasionally, five hundred yards) from the spot where he left the ground. Of course, this is not flight properly speaking, but, as foreseen by Lord Rayleigh in 1883, it is through such experiments that we may learn the technics of flying and steering. Through them we learn also a good deal about the lifting force of the wind. Thus, during one of his experiments, Lilienthal was caught by a gust of stronger wind, and instead of being thrown backwards by it, or being overturned (this last was prevented by a timely manœuvre of the feet), he was *lifted* to a higher level than the spot where he left the ground. He simply received an object-lesson in soaring.[3] It is known, indeed, that when a fresh breeze is blowing, many big birds, after having reached a level of from two hundred to three hundred feet by means of strokes of their wings, remain almost motionless in the strong breeze, and by simply changing the inclination of their wings and the direction of their gliding they gradually rise to the level of two thousand and three thousand feet, as they describe their great spirals. Rising in the air, without spending any muscular effort, certainly sounds like a paradox; but the best naturalists, including Audubon

[1] *Nature*, August 30, 1894. Of course, there is a certain relation between the area of the surface and the weight it has to support. In large birds, a surface of wings ten and a half square feet easily supports a weight of eighteen pounds. A concave surface, as shown by Lilienthal, supports a greater weight than a plane surface of equal area.

[2] See his work on the subject, his later papers in the *Zeitschrift für Luftschiffahrt*, Dr. A. Dubois Reymond's account to the Berlin Academy (December 15, 1893), and the accounts given in *Nature* (vol. l.) and the aeronautic papers.

[3] The diagram of this case is given in the *Zeitschrift für Luftschiffahrt*, 1893, ii. 259.

and Darwin, are unanimous in testifying that in such flight the birds do not flap their wings; they even do not move the feathers of their wings; and it now appears certain, after a long discussion has run through the papers on the subject and exhaustive experiments have been made, that no such movement is needed in reality. The bird, gliding against the wind, is lifted by it and rises to a higher level, in the same way as Lilienthal was thrown upwards against his own will; and it takes advantage of the thus gained height for gliding down a slightly inclined line and for acquiring velocity, which permits it again, after it has turned against the wind, to win in height. But still these manœuvres did not well explain how the bird could gradually rise to a higher level, and some uncertainty continued to prevail about the matter.

The key to the puzzle (foreseen by Lord Raleigh as early as 1883,[1] and indicated by Mouillard) was finally given this year by Professor Langley, again on the basis of physical experiments, in which the American physicist is known to excel. The explanation is in the "waves and gushes" of which every wind consists. Wind, we now learn, is not what it is usually considered to be. It is not "a mass of air in motion," but consists of small masses moving with such irregularities of speed as we never suspected before. By means of very light paper anemometers, the rotations of which were measured every second instead of every minute, Professor Langley ascertained that the velocity of wind is continually changing. It varies every second, and while the average velocity may be twenty-three miles, it will, in the course of one minute, be altered several times, from twenty-three miles to thirty-three miles, back to twenty-three, then to thirty-six, then fall to zero, and so on. So that a heavy bird which glides with a certain velocity through the air can constantly utilize the gushes of the wind to be lifted, without ever using its wings for flapping. It has, as Professor Langley shows by direct experiments upon floating surfaces, merely to change the inclination of its wings in order to win in height, and then to spend part of the potential energy in acquiring velocity,[2] all this with the judgment which it derives from its experience of the medium it lives in. The differential energy of the gushes supplies the necessary energy for lifting the bird. These considerations explain why birds succeed with so little or no effort in rising to great heights, or in covering immense distances. They do what the boatman does when he takes advantage of a gust of wind to progress under sail. They may be said to take tacks, but in a vertical direction.

The above sketch can only convey a very faint idea of the rich body of data upon which scientific investigation bases its conclusions as to the full possibility of aerial navigation by means of a machine which is heavier than air. All the elements of the problem are being settled one after the other by experiments and calculations, and the points in which the aid of the mathematician is especially required are indicated. The data are there, and what is wanted is the creative inspiration to utilize these data. And in this direction, the machine of Mr. Maxim, the very successful models of Mr. Hargrave, worked by small steam-engines,[3] and the flying experiments of Lilienthal, are important steps already made. The solution thus seems to lie now within a measurable distance from our own times — unless a wind of reaction, such as has already blown twice in the

[1] He remarked in *Nature* (xxvii. 535), at the end of a long discussion which had run through the paper, that *wind is not uniform*, and he inquired "whether anything can be made of the difference of horizontal velocities which we know to exist at different levels." Leonardo da Vinci was also very near to this solution. He also explained the rising of the bird by the "waves and gushes" in the air.

[2] S. P. Langley, "The Inner Work of Wind," in *American Journal of Science*, 1894, 3rd series, xlvii. 41.

[3] Journal and Proceedings of the Royal Society of New South Wales, 1892, xxvi. 170, and 1893, xxvii. 75.

past, comes to throw again into oblivion all that has been done up to this date.

P. KROPOTKIN.

From Temple Bar.

"WITH COMPLIMENTS AND THANKS."

I.

IT was about an hour before midnight, and Dick Everard's rooms at Cambridge were full of visitors. Although he was in his third year, he still kept in lodgings, on the ground of greater comfort. The furniture was of the usual kind; on the walls a few engravings, purporting to be proofs, a well-filled pipe-rack, and a couple of tin shields bearing the arms of their owner's school and college. In one corner lay a pile of caps and gowns belonging to his visitors, most of whom were smoking comfortably in easy-chairs, while one, unheeded by the rest, was pounding out the "Gondoliers" from an ancient piano. On the table were whiskey and tobacco, and the bookshelves contained some battered novels and some very new-looking editions of the classics. And on the hearth-rug, to complete the catalogue, stood Dick Everard himself, whose ordinarily smiling countenance was at this moment flushed and indignant, for he was just bringing to an end an eloquent and impassioned speech. Its subject was the corruption of the press and the awful ignorance of editors, and it was based on personal experience.

"The whole system," he cried in conclusion, "is utterly rotten, and our papers and magazines are controlled by a narrow-minded clique. It is a notorious fact that editors have no true sense of their duty, and simply refuse to look at an outside contribution. What we must demand — what we must insist upon (it's no good your sniggering like that, Tom) is a thorough and complete reform!" with which noble peroration the orator ceased, and began to refill his pipe, which had been allowed to go out in his excitement.

"Hear, hear!" said Tom Longley, the smiling critic referred to. "You ought to speak at the Union, Everard. And which is the particular sinner this time?"

"Well, you fellows remember a story of mine which I read you last term, 'The Widow's Curse' it was called? You told me yourselves, some of you, that it was the most pathetic thing you had ever heard."

"So it was," remarked a cheerful little man, the cox of his college boat, whose real name happened to be Reginald Crawshaw, but who was always known as "Stumps" — "So it was. You read it to us that evening when most of us had been to Baitsbite and back, and were simply longing for bed. And so the 'Curse' has come here to roost, eh?"

"Don't talk rot, Stumps," answered the indignant author; "you know you admired it. Though I wrote it myself, I can't help seeing that it is better than nine-tenths of the things that appear in the magazines. Well, I sent it to the editor of the *West-End Review*, thinking that he would simply jump at it. And this morning I get it back again — Declined! A story which is far and away better than the trash in this month's number!"

"The editor ought to be kicked," said Stumps sympathetically; "let's hear his letter."

"He hasn't even the common civility to send a letter, only a printed form. Here it is," and Everard drew a small slip of paper from his pocket. 'The editor of the *West-End Review* regrets that he is unable to make use of the enclosed story, which he therefore returns with his compliments and thanks.' As if I wanted his thanks!" and he proceeded moodily to relight his pipe with the offending document.

"Rough luck, Dick," said Tom Longley; "but surely there are plenty of other magazines whose editors may have better taste. And this fellow will feel badly scored off when he sees the

'Accursed Widow'—What? Oh, I'm sorry—the 'Widow's Curse'—printed in another paper. Why not offer it somewhere else?"

Everard smiled sadly.

"Ah, that's just it," he answered; "one editor is as bad as another. There is—it is a well-known thing among literary men—a disgraceful conspiracy among them not to look at outside work, and unless you get within the ring, your chances are quite worthless."

"Talking of the ring," said another stolid-faced youth, who had been placidly dozing, "did you chaps see that Slavin——"

"Shut up, Bill!" said Stumps sternly, "None of your *Pink 'Un* talk to-night. We are all intellectual—we are going to help a rising genius—you, Everard—to delight a grateful public."

"He had better begin," said the man at the piano, suddenly ceasing his performance, and turning round on the music-stool, "by pacifying an angry tutor. You cut Dodgson's Plato lecture again to-day, Dick, and he didn't look pleased. You'll get ploughed in your Tripos, unless you're careful. Why on earth you don't give up that writing nonsense, in which you will never do anything, and stick to classics, I can't conceive. And if you must write, why not send your things to the *Granta*?"

"The *Granta*, indeed! A mere frivolous rag," said the author. "You mentioned old Dodgson—and it is men like that, who are in places of authority, that are the real curse of the university—bigoted pedants, who look upon their own knowledge as the sum of scholarship. Why should I go to a Plato lecture? I hate classics, and I should be left to develop my literary tastes unimpeded; so ought every one—we want breadth and culture, every one ought to be left to improve his mind according to his natural bent."

"Great idea," said Stumps. "Bill here would smoke and read the *Sportsman* all day, and Longley would play golf at Coldham every morning. I should have to tub Freshers all day long, though, I suppose," he added mournfully, "and I think I'd almost as soon listen to old Rollison lecturing on trigonometry."

"Well, Dick will be free to develop his literary tastes—in the bosom of his family—if he is not careful," said the musician, "for if he goes on in this way, scribbling every morning, and cutting all his lectures, he'll be sent down."

"What if I am?" exclaimed Everard; "I shall not be the first—er——"

"Genius," prompted Stumps.

"Whom the university has failed to appreciate. Look at the tutor, old Dodgson, now. What does he know of literature? What sympathy has he with art, or with the artistic temperament? I have, as you know, the artistic temperament." ("Hear, hear," from Longley. "Does it hurt much?" from Stumps.) "And they expect me to give my whole attention to conditional sentences and Greek particles! How can a man like Dodgson understand my feelings?"

"Give him the 'Widow's Curse' to read," suggested some one; "that would make him sit up a bit."

"Put him in as the villain in your next story," said Stumps; "that's what these novelist chaps always do with people whom they don't like."

"Well, I tell you what it is," resumed Everard, taking no notice of these friendly suggestions, "I am not going to stand it any longer—I am going to no more lectures this term, and I shall tell old Dodgson the reason why. We will form a league—a society to break down the barriers of narrow prejudice."

"I am on," said Tom Longley. "The Anti-Lecture Company. Capital unlimited. Object, the total suppression of lectures and exams. President, R. Everard, Esq., Author of 'The Widow's Curse' and other works. Vice-President, T. Longley, Esq. Secretary—let's see—— Suit you, perhaps, Stumps?"

"None for me, thanks," answered the cautious Stumps. "I'll join the

board after allotment, and wait and see whether you fellows get gated or not before committing myself."

"It seems to me," said Warburton, the man on the music-stool, "that you, Dick, and you other chaps are talking nonsense. Look at all the most successful men of the day — statesmen and lawyers and authors — nearly all of them began by taking good degrees at the 'varsity. Much better stick to your reading, Dick, and then you will have something more to show for your three years at Cambridge than a valuable collection of 'Declined with thanks' forms from every newspaper in London. And then you can take to literature seriously, if you still want to, later on. Your present system doesn't pay, in any sense."

"You are entirely wrong," answered Everard impatiently. "Do you suppose that Thackeray or Tennyson were any the better for what they learnt at college lectures? And as for your remarks about my writings, it is quite true that editors are partial and unfair as a general rule, but yet merit must prevail in time. Why, the *Clarion* published a sonnet of mine quite lately."

"But forgot to pay you," remarked Warburton.

"And the long and short of it is, that I have determined to make a name in literature for myself — and I am going to no more lectures."

"For which you will be precious sorry before long," Warburton said. "The proper object of Cambridge — "

"Oh, dry up, you two," broke in Stumps; "we've had enough of your blessed arguments for one night. I say, have you chaps heard that Johnson's been asked by the president to row to-morrow?"

"What! *Johnson?*" chorussed the rest, and literature gave way to a hot discussion on the merits of the Trial Eights crews then being made up — a discussion only ended by the sudden discovery that it wanted but two minutes to midnight, by which time they had all to be in their colleges. Then ensued a tumultuous rush for caps and gowns, and in half a minute Everard was left alone. He lit another pipe, and sat down to write a chapter of his latest story, but felt weighed down by the certainty that no editor would accept it. And so, after a short interval, he went to bed.

When he awoke on the following morning, he remembered that he had a Thucydides lecture at ten o'clock, and lay in bed considering whether or not he should attend it. On the whole, he felt that it would be impossible to do so after his brave words of the evening before. At the same time, however, he was aware that his tutor was likely to make things unpleasant for him, and his father, who, being a respectable solicitor, had no sympathy with literature, would certainly not welcome his premature reappearance in the domestic circle. "I must make this protest for the sake of art," reflected Dick, "and, besides, I couldn't face those fellows if they saw me at lecture to-day after what I said last night. But there's no denying that old Dodgson's a beast, and I shall probably get into ——"

"Hot water, sir!" said his landlady, knocking at the bedroom door.

II.

As Everard was coming out of hall on the following evening he was stopped by the fellow's butler, a solemn person, with an impassive countenance. "Mr. Dodgson's compliments, sir," he said, reading from a slip of paper in his hand, "and he'd like to see you at eight o'clock." And he moved on to repeat the unwelcome invitation to another delinquent.

It must be confessed that Everard's feelings, as he crossed the court, and walked up the old oak staircase that led to his tutor's rooms, were not wholly enviable. Might not it have been more prudent, after all, to have attended that Thucydides lecture? To suffer as a martyr for the sake of literature was all very well, but there was also the distinct and unpleasing vision of his reception by his family were he to be sent down. However,

there was no help for it now, so he assumed an air of as much heroic fortitude as he could muster, and walked up-stairs.

At the top of the staircase, outside Mr. Dodgson's door, he found a group of half-a-dozen men all, like himself, waiting for an interview with their tutor. "Hullo, Dick," exclaimed one of them, as Everard made his appearance, "you here too? Old Doddy 'll be gating the whole college next. Sickening, I call it."

"Yes, he means business to-night, and no mistake," said another man. "He told Rogers he was a disgrace to the college, and gated him at eight for a week just for sticking sunflower seeds in the grass out in the court. Rogers said it was to cultivate an æsthetic taste in the college, but it wasn't any use. Here comes Bubbles. Well, what luck, Bubbles?"

The door opened, and a stout youth with a dejected countenance appeared, and another man entered the tutor's rooms in his place. "None at all," sighed Bubbles. "He asked me why I hadn't kept a chapel for a fortnight. I told him I was there in spirit. 'Oh,' says old Doddy, with that sarcastic smile of his, 'you are one of those fortunate beings who can dissociate your mind and your body at will? This is really most interesting. Of course, then, I need feel no compunction in gating your body, as your spirit will be able to visit your friends as usual.' Old beast!" said Bubbles, shaking his fist at the door. "Well, I wish you chaps luck," and he went down the stairs whistling.

One by one the remaining members of the group were summoned into the tutor's presence, to return presently looking cheerful or mournful according to the result of the interview. Everard, as the last comer, had to wait until justice had been dealt out to all the others, a process which took some time, during which, like Mr. Bob Acres, he felt his courage oozing away from him. At last, however, his turn came.

"Sit down, please, Mr. Everard," said the tutor suavely, who was engaged in jotting down some memoranda, referring, probably, to the previous interviews. He was a tall, middle-aged man, with shrewd eyes, which glanced keenly through a pair of spectacles at the person whom he was addressing. His dress was rather untidy, and the large writing-table as well as the sofa and chairs was thickly covered with an enormous quantity of papers and books and pamphlets. The room, no less than its occupant, impressed you with the idea of an industrious and active brain.

At length Mr. Dodgson looked up from his writing.

"Well, Mr. Everard," he began, "you doubtless are aware why I sent for you. Have you any explanation to offer of your repeated absence from my lectures?"

Everard felt that the crisis had come; now or never was the time to vindicate his independence as a literary genius. But his eloquence of the previous night failed him.

"Well, sir, the fact is — my real work — limited time — I mean, you see — in fact" — growing desperate — "I don't intend to come to any more lectures."

There was a pause. Mr. Dodgson took off his spectacles, wiped them, replaced them carefully, and glared at Everard as if anxious to convince himself that this was really an undergraduate, and not some new kind of animal. And Dick's gaze was directed to the floor, while he fervently wished himself anywhere but in his present situation.

"Ah," said Mr. Dodgson at last. "And when, may I ask, did you form this — this remarkable resolution?"

"Last night, sir," answered Dick, feeling more and more uncomfortable.

"Last night," repeated the tutor, as if trying to grasp the meaning of the words, "you resolved — last night — that you would attend — no more lectures. Dear me. Would it be presuming too much if I were to ask your reasons for your — startling — determination?"

"The fact is, sir," answered Everard, mustering up a little courage, "that my talents do not lie in the direction of the Classical Tripos."

"I am disposed to agree with that view," put in the tutor dryly.

"And, on the other hand, I feel that I am destined to make a name in literature. It is as a novelist that I must distinguish myself; without boasting, I may say I have some originality."

"Your conduct has already convinced me of that."

"But, if I am to do myself justice, my whole time henceforth must be devoted to the art of fiction."

"Judging from some excuses I have had to-night, you are not without fellow-students in this college."

"And it is therefore mere waste of time for me to spend the mornings at Thucydides lectures. You, sir, are no doubt an eminent classic."

Mr. Dodgson bowed gravely.

"But you have no knowledge of, or sympathy with, modern English literature. If you had, you would know how difficult a thing it is to overcome the cliquism and prejudices of editors, and how the task is one to which it is necessary to give one's whole time and attention."

Had Everard possessed the necessary courage to look at his tutor, he would have seen that gentleman doing his utmost to repress a smile. His voice, however, was quite grave as he replied: "Indeed, Mr. Everard, I had no idea that we were nurturing a rising literary genius in our midst. Have your efforts met with much success hitherto?"

Dick blushed somewhat. "Not yet, sir," he answered; "but I can't help thinking that this is chiefly due to the short-sighted folly of the editors, who will never take a good thing from a man outside the ring. Why, quite lately"—Dick was warming to his subject, and had wholly lost his dread of his tutor—"I sent a story to the *West-End Review*—a monthly magazine, you know, sir—perhaps you've never seen it?"

"I seem to have heard the name," said the tutor.

"Well, then, perhaps you know what poor stuff is often printed in it. Yet they rejected my story, which was really powerful. Unless I read it to you, you wouldn't understand its good points."

"Unless by any chance," interrupted Mr. Dodgson, with a quiet smile, "it was called 'The Widow's Curse'?"

Everard sprang to his feet in his astonishment. "How on earth do you know that?" he shouted, quite forgetting in his excitement, that he was addressing his college tutor.

"Pray be seated," answered Mr. Dodgson tranquilly. "How do I know it? Merely from the curious fact that I happen to be editing the *West-End Review*."

Dick sat down heavily in his chair and gasped. The remembrance of his remarks about dons and editors completely crushed him. This was indeed an awful staggerer, to find that old Dodgson, whom he had always thought of contemptuously as a mere classical pedant, was in fact the editor of one of the leading magazines!

"Don't be alarmed, Mr. Everard; I am not in the least offended by your remarks about editors in general, and the director of the *West-End Review* in particular, though you can hardly expect me to agree with them. Besides, before long your opinions on this subject may be somewhat altered. And now, my dear fellow"—could this be the stern tutor?—"let us look at the matter from a common-sense point of view. We must have no more talk of not attending lectures. You are here at Cambridge for many reasons, but one of the most important is to train you to work hard at subjects for which you may have but little liking, and for having learnt this lesson you will be grateful when you have forgotten every word of Greek. Go on writing by all means, but make your work for your degree, both for your parents' sake and your own, the main thing. As to the 'Widow's Curse,' I remember reading it quite well, and there is a good deal of promise in it. So many contributions come in that I

didn't notice its author's name particularly, and certainly did not connect it with the gentleman who cuts my Thucydides lectures. However, as I said, there is a good deal of promise in the story, though it must be greatly toned down and given a less melodramatic title before we can use it. Bring it to me before the end of the term, and I will give you a few hints, by the aid of which you can retouch it in the vac., and then I dare say we'll find a corner in the magazine for it somewhere. Good-evening. Oh, by the way, I must ask you not to mention our conversation to any one, as I prefer — for many reasons — my connection with the periodical press not to be generally known in the college. Good-evening."

Everard could do no more than blurt out "Good-evening, sir," and stumbled down the stairs like one in a dream.

While passing through the court he was met by Stumps, who accosted him cheerily: "Hallo, Dick! Just been round to your rooms. Will you play racquets to-morrow morning? There's only one lecture, and I know that you don't mind cutting that. Why, what's up, man? You look as solemn as an owl! Those editors been at it again?"

Everard looked vacantly at his friend, and answered him slowly and distinctly in the following terms: —

"I will not play racquets to-morrow. The man who cuts lectures is a fool. And editors are the best, the noblest, and most disinterested of mankind. They are always willing to help genius; they are the true glory of this country."

And he passed on by the porter's lodge into the night, leaving Stumps speechless. ANTHONY C. DEANE.

From The Contemporary Review.

WALTER PATER: A PORTRAIT.

FEW recent events can have surprised and saddened the sincere lovers of literature more than the death, in middle life, of Walter Pater. A peculiar vexation, so to speak, was added to the natural grief such a loss must have caused, by the strange inexactitude, in matters of detail, which marked almost all the notices of his career which appeared at the time. In most of these notices, it is true, there was manifested a wish to pay homage to one of the most exquisite, the most self-respecting, the most individual prose writers of the age; but knowledge, especially of his earlier years and intellectual development, was lacking. He was one who never had tempted the interviewer, who had never chatted to the press about himself, and facts regarding him were not at that abrupt moment forthcoming. How far accidents of time and place were responsible for aiding this condition of things it were now perhaps idle to speculate. The fame of Walter Pater will not be wrecked on the holiday of an editor or the indolence of a reporter. It is grounded on the respect which has not yet failed to follow pure and distinguished excellence in the art of writing. As years go on, he will more and more find his admirers, the rescuers of his renown. A subtle and penetrating essay by Mr. Lionel Johnson (in the *Fortnightly Review* for last September) has already pointed the way to those whose business it will be to detect Pater's influence upon his age, and to illustrate the individual merits of his style. In the following pages an attempt will be made to present the facts of the uneventful career of the author of "Marius," so oddly travestied at the moment of his death, with some regard to continuity and truth. In preparing this sketch, I have had the encouragement and the help of the surviving members of his family, without whose co-operation I should not have undertaken such a task.

I.

A VERY considerable interest attaches to the parentage of Walter Pater. His family was of Dutch extraction, his immediate ancestors having, it is believed, come over from the Low Countries with William of Orange. It was said, and our friend loved to believe it, that the court painter, Jean Baptiste Pater, the pupil of Watteau,

was of the same stock. If so, the relationship must have been collateral and not direct, for when the creator of so many delicate *fêtes champêtres* was painting in Flanders — he died in 1736 — the English Paters had already settled at Olney, in Buckinghamshire, where they lived all through the eighteenth century. Reserved and shy, preserving many of their Dutch customs, they are described in family tradition as mixing little with their neighbors, and as keeping through several generations this curious custom, that, while the sons were always brought up as Roman Catholics, the daughters were no less invariably trained in the Anglican faith. The father of Walter Pater quitted the Roman Church before his marriage, without adopting any other form of faith, and his two sons were the first Paters who were not brought up as Catholics.

Towards the close of the eighteenth century, the poet Cowper was the fellow townsman and the friend of the Dutch emigrants in Olney, and the family long possessed some of his verses in his own manuscript. The son of the man who had known Cowper quitted the Buckinghamshire household, and went out to America. He settled in New York, associating chiefly with the Dutch colony in that city; here his son, Richard Glode Pater, the father of the critic, was born. The family came back in the beginning of the present century, and settled at Shadwell, on the north shore of the Thames, between Wapping and Stepney, a situation now of extreme squalor, but eighty years ago still considered countryfied and pleasant. Here, after his father's death, Richard Glode Pater continued to live, a medical practitioner working, mainly, for the love of them among poor folks in the East End, refusing to move into a more fashionable quarter, and despoiling himself of his patrimony by his constant benevolence.

To the house in Shadwell, Richard Glode Pater brought Maria Hill as his wife, and here were born to him four children, two of them sons, of whom Walter was the second. The elder son, William Thomson Pater, adopted his father's profession, and became the head of a large lunatic asylum. He died unmarried, on April 24, 1887, at the age of fifty-two, "quitting," in his brother's words, "a useful and happy life." In him, however, with the exception of a marked pleasure in being surrounded with pretty objects, not a single feature had ever shown itself of the peculiar intellectual characteristics or tastes of his brother. The future critic was born at Shadwell, on August 4, 1839, receiving the names Walter Horatio, in compliment to a cousin who survives him.

Richard Glode Pater died so early that his second son scarcely remembered him in later life. The mother and grandmother left the house in Shadwell, and went to live with a sister of the former at Enfield, where the children were brought up. In the retired neighborhood of Chase Side they took a house, which has since been pulled down; it possessed a large, old-fashioned garden, in which the children found great delight. It would be an error to trace in the imaginary portrait called "The Child in the House," a definite picture of the early surroundings of Walter Pater. The existence at Enfield is hardly touched upon there, with the sole exception of the "cry on the stair," announcing the death of Florian Deleal's father; this, it appears, is a reminiscence of the decease, not of his father, but of his grandmother, which was so announced to the household at Enfield. So far as "The Child in the House" depicts a veritable scene, it presents to us Fish Hall, near Hadlow, Kent, the residence of his godmother and cousin, Mrs. Walter H. May; this mansion, part of which was very old, was the favorite holiday-haunt of the little Paters, and a place of mystery and romance to Walter.

If, however, "The Child in the House" must be accepted very guardedly as giving an impression of the physical surroundings of Walter Pa-

ter's childhood, much more of actual reminiscence has been put into "Emerald Uthwart" (a story not yet printed in book-form). The first elements of education were given at the private house of the head master of the grammar school at Enfield, but the earliest crisis of Pater's life was the entrance into King's School, Canterbury, at the age of fourteen. The "old ecclesiastical city," to which Emerald proceeds, is Canterbury, closely and exactly described, and the features enumerated in the story — "the curiosities of the Precincts, the 'dark entry,' the rich heraldries of the blackened and mouldering cloister, the ruined overgrown spaces where the old monastery stood, the stones of which furnished material for the rambling prebends' houses" — these were features at Canterbury which immediately impressed the imagination of the shy and sensitive little boy, and remained with him through life as having given him his earliest experience of æsthetic pleasure.

It seems probable, that, on the whole, this part of "Emerald Uthwart" may be taken as strictly autobiographical. Pater was happy at King's School, in spite of his complete indifference to outdoor games. In his first years at public school he was very idle and backward, nor was it till he reached the sixth form that his faculties seemed really to awaken. He is remembered as rather a popular boy, and as years went on his unquestioned ability inspired respect. On the day of his funeral the Warden of Keble preached in the Cathedral of Canterbury, and was able to record, in touching phrases, the pride which the school had always felt in him, and Pater's own persistent attachment to the school. From the first, and before he went to school, Walter had been considered the "clever" one of the family; not specially precocious, he was always meditative and serious — marked from the very first for the intellectual life. It is interesting to note that, quite without prompting from without, and while still at Enfield, all his thoughts were turned towards the Church. He loved best to organize a sort of solemn processional game, in which he took the part of bishop or cardinal. From the time when he first began to think of a future condition, his design was to be a clergyman; never, curiously enough, a priest in the religion of his fathers, but in the Anglican ritual. Throughout life, it may here be said, even in his later days, when his thoughts turned back more and more to theological preoccupations, Walter Pater never had any serious leaning towards Rome. Yet there can be little question that the heritage of his ancestors, in their obstinate adhesion to Catholicism, had much to do with his haunting sense of the value of the sensuous emblem, the pomp of color and melody, in the offices of religion. These tendencies had received a great impetus while he was yet a little boy, and had not proceeded to Canterbury, from a visit he paid to a young friend who lived at Hursley. Here he attracted the attention of Keble, who walked and talked much with him, and encouraged him in his religious aspirations. Pater retained through life a vivid recollection of this saintly man, although he never saw him again.

Shortly before he left school, as he was entering his twentieth year, Pater read "Modern Painters," and came very abruptly under the influence of Ruskin. The world of art was now for the first time opened to him. It is necessary at this point to refute an extraordinary fable, widely circulated at the time of his death, to the effect that the finished and beautiful essay on "Winckelmann" was written and even printed, while the author was a schoolboy at Canterbury. The idea is preposterous; it was not until many years later that Pater became aware of the existence of the German critic, and his essay was composed and published long after he was a fellow of Brasenose. It is singular, indeed, that he is not known to have made any attempt to write, either as a schoolboy or an undergraduate, his earliest essays being as mature in style as the author was mature in years. Pater made no painful

experiments in authorship, or, if he did, he kept them to himself. He did not begin to practise the art of writing until he had mastered all its secrets.

On June 11, 1858, he entered Queen's College, Oxford, as a commoner, with an exhibition from Canterbury; and four years later, in the Michaelmas term of 1862, he took his degree, gaining only a second class in *Literæ Humaniores*. Of these years of his undergraduate life it does not appear that there is much to reveal. In bare rooms, in the dim back quadrangle of his college, Pater worked quietly and unobtrusively, making few friends, very shy and silent, hardly observed in the noisy Oxford life of thirty-five years ago. He was the pupil of Mr. W. W. Capes, now rector of Liphook, then bursar and tutor of Queen's, and amongst those very rare spirits who divined the man he was to be was his earliest friend, Mr. Ingram Bywater, now Regius professor of Greek. It is not understood that during these undergraduate days Pater's mind, a seed slowly germinating in the darkness, showed much partiality for pure literature or for plastic art. He was fascinated mainly by the study of logic and metaphysic, which were his pastimes, while the laborious business of classical scholarship occupied all but his leisure moments. Whether any record of these silent years remains, even with the few friends who shared them, seems doubtful. Pater never kept a diary, rarely wrote letters, and at this time offered no salient points for observation to seize upon. Yet one far-seeing man had noted the peculiar originality of Pater's temperament. Having in the ordinary course of his studies submitted some work to Jowett, that astute observer was so much struck with his power that he very generously offered to coach him for nothing. The offer was gratefully accepted, and Pater used to describe the thrill of gratification, and, still more, of astonishment, which he experienced when Jowett said to him one day, as he was taking his leave: "I think you have a mind that will come to great eminence." Unhappily, some years after there was a complete estrangement of sympathy between Jowett and Pater. But it is pleasant to record that, in the last year of the life of each, it was removed, and that Jowett was among those who congratulated Pater most cordially on his "Plato and Platonism."

In 1862 — his degree had been a disappointment — Pater, now three-and-twenty, took rooms in the High Street, Oxford, and read with private pupils. Of these Mr. T. H. S. Escott has told us in his pleasant reminiscences of Oxford that he was one. Another pupil, of somewhat later date, was Mr. Charles Lancelot Shadwell, now fellow of Oriel, destined to become the most intimate of all Pater's friends, and now the guardian and editor of his papers. But still no definite aim seemed to have revealed itself to the future critic; he was reading and meditating deeply, but he had as yet no call to create. Time went by; in 1864 Pater was elected a fellow of Brasenose College, and went into residence there. With this change in his material existence, a change came over his mind. His sympathies grew wider and more human, he became more of a student of poetry, he formed more friendships, and was more assiduous in their cultivation. At last, in 1866, at the age of twenty-seven, he ventured to write and to print a little essay, a note or fragment, on Coleridge. We may read this first expression of a new writer to-day in the "Appreciations." We shall find little of the peculiar charm of the mature Pater. His interest is solely in Coleridge, the metaphysician, the critic of thought; that this same philosopher was an exquisite poet has not occurred to him, he positively forgets to mention the fact. As far as style is concerned, the little essay is correct and cold, without oddity, but with little trace of the harmonious felicity which was about to develop.

Vast is the change when we meet Walter Pater next. He had come from school with a tendency to value all things German. The teaching of Jow-

ett and of T. H. Green tended to strengthen this habit, but Mr. Capes warned him against its excess, and endeavored, at first with but little success, to attract him to the lucidity and gaiety of French literature. Pater's studies in philosophy now naturally brought him to Goethe, so massive an influence in the Oxford of that day, and the teaching of Goethe laid a deep impress upon his temperament, upon his whole outlook on the intellectual life. It was natural that one so delicately sensitive to the external symbol as was Pater should be prepared by the companionship of Goethe for the influence of a man who was Goethe's master in this one direction, and it was to a spirit inflammable in the highest degree that in 1866 was laid the torch of Otto Jahn's life of Winckelmann, the "Biographische Aufsätze." There was everything in the character and career of the great German restorer of Hellenic feeling to fascinate Pater, who seemed, through Ruskin, Goethe, and Hegel, to have travelled to his true prototype, to the one personality among the dead which was completely in sympathy with his own. Pater, too, among the sand-hills of a spiritual Brandenburg, had held out arms of longing towards ideal beauty, revealed in physical or sensuous forms, yet inspired and interpenetrated with harmonious thought. The troubled, feverish vision, the variegated and indeed over-decorated æsthetic of Ruskin, had become wearisome to Pater — not simple enough nor sensuous enough. Winckelmann was the master he wanted, who could "finger those pagan marbles with unsinged hands, with no sense of shame or loss," who could live serenely "in a world of exquisite but abstract and colorless form;" and it was with the study of Winckelmann that he became himself a writer.

His famous essay on "Winckelmann" was the result of this new enthusiasm. It was published in the *Westminster Review* for January, 1867, the author being now in his twenty-eighth year. From this time Pater's advance, though slow, was unbroken. Mr. John Morley having, in 1867, taken the editorship of the *Fortnightly Review*, called around him immediately a group of the most brilliant young men of the day. Walter Pater was in no undue haste to respond to the appeal. In 1868, inventing a name which has since sunken into disrepute and even ridicule, he published an essay on "Æsthetic Poetry," in which the early work of Mr. William Morris received prompt and judicious analysis. Then followed the series which are still so potent in their peculiar charm, the magnificent and most characteristic "Notes on Lionardo de Vinci," in November, 1869; the "Fragment on Sandro Botticelli" in August, 1870; the "Pico della Mirandula" in October, and the "Michelangelo" in November, 1871. In 1873 most of these, and others, were published together in the memorable volume originally entitled "Studies in the History of Renaissance."

At this point he becomes partly famous. We may look back over the years which followed his fellowship, and see that, with the accession of humanistic ideas, he had gradually lost all belief in the Christian religion. This was the point, in his whole career, at which he was furthest from the Anglican faith. His intention, on relinquishing the idea of entering the Church of England, had been to become a Unitarian minister. This also he had abandoned by 1864. But that Pater's interest in ecclesiastical matters was never really dead, and that it soon began to revive, is proved by an anecdote with which the Bishop of Peterborough obliges me. He remembers dining with him in 1873, in company with Bonamy Price. Conversation turned on ecclesiastical matters, and Pater passed on to a dreamy monologue about the beauty of the reserved sacrament in Roman churches, which "gave them all the sentiment of a house where lay a dead friend." This immediately aroused the Protestantism of Bonamy Price, and a theological discussion ensued which waxed so warm that Dr. Creighton had to suggest a

retreat to the drawing-room. When he came up for election at Brasenose it was as a non-clerical fellow — I think the first who ever was appointed there — that Pater took his place in the society. In the next year, in company with Mr. Shadwell, he paid his first visit to Italy, and at Ravenna, Pisa, Florence, formed those impressions of the art of the Renaissance which were so powerfully to color all his own future work as an artist. In 1858, when he came to Oxford, his sisters had migrated to Heidelberg, and here it was his custom to spend the long vacation, making no friends among the Germans, however, and never, in all those years, troubling himself to learn to speak their language.

II.

THE costume of Walter Pater had been the ordinary academic dress of the don of the period, but in May, 1869, he flashed forth at the private view of the royal Academy in a new top hat and a silk tie of brilliant apple-green. This little transformation marked a crisis; he was henceforth no longer a provincial philosopher, but a critic linked to London and the modern arts. Where he touched the latter was through the pre-Raphaelites, especially through the extreme admiration he had conceived for the works of Mr. Burne-Jones, then much talked about, but rarely seen. At no time, I think, had he much personal knowledge either of that painter or of Rossetti. With Mr. Swinburne he became about that date more intimate. The poet was a not unfrequent visitor in those years to Pater's college rooms. To all young Oxford, then, the name of Mr. Swinburne was an enchantment, and there used to be envious traditions of an upper window in Brasenose Lane thrown open to the summer night, and, welling forth from it, a music of verse, which first outsang and then silenced the nightingales, protracting its harmonies until it disconcerted the lark himself at sunrise.

After this, it is a notable instance of the art of sinking to record that I first set eyes on Pater in 1871, as he and Mr. Swinburne were dismounting from a hansom cab at Gabriel Rossetti's door in Cheyne Walk. Almost unknown to the world, he was already an object of respect to me as the author of those "Notes on Lionardo," which had seemed to give a new aspect to the whole conception of Italian art. In 1872 I was presented to him in the studio of William Bell Scott; it was not until the early months of 1874 that I first began to visit him at Oxford, and so opened a friendship which was never clouded for a moment in the course of more than twenty years. From this point, then, although my opportunities of seeing Pater, especially in Oxford, were but occasional, I can record something from personal knowledge.

In 1869, removing from Brasenose many of the pretty objects and *bric-à-brac* with which he had been the first man in Oxford to decorate college rooms, Pater furnished a little house in Norham Gardens, No. 2 Bradmore Road, his sisters returning from Heidelberg to keep house for him. Once settled here, Pater blossomed out into considerable sociability, entertaining and being entertained in the cordial Oxford way. He had now a large circle of pleasant acquaintances; I cannot remember that he had many intimate friends. Besides those whom I have mentioned already, I can but recall Mark Pattison, Dr. Mandell Creighton (now Bishop of Peterborough), and Miss Mary Arnold, soon to marry an accomplished young member of Pater's own college, Mr. Humphry Ward. To these he would doubtless talk, to each in a different way, of the interests most deeply rooted in his heart, "of charm, and lucid order, and labor of the file," and to a very few London friends also. The rest of the world found him affable and acquiescent, already in those remote days displaying a little of that Renan manner which later on became emphasized, a manner which trifled gracefully and somewhat mysteriously with a companion not entirely in sympathy.

Pater's relation to the rector of Lincoln was amusing. It was at once confiding and suspicious. "Pattison is charming," he used to murmur, "when he's good. Shall we go over and see if he is good this afternoon?" But he was worried by a certain wilfulness in the rector; he could prove to be so far from good, so absolutely naughty. I remember on one occasion — I think in the autumn of 1874 — when the rector, on a visit at Bradmore Road, had been delicious; he had talked, in his most distinguished way, on a dozen rare and exquisite topics. He left, begging Pater to come to him next day, and kindly extending the invitation to me. Accordingly we went, but the charm was broken. A frivolous demon had entered into the rector; he talked of croquet and of petticoats. We went back, sad and silent, to Bradmore Road, and, just as we reached home, Pater said, with solemn firmness, "What Pattison likes best in the world, no doubt, is romping with great girls in the gooseberry-bushes!"

The vacations in these years were very pleasant to Pater; they were almost always spent abroad — in France, in the company of his sisters. He would walk as much as possible, scouring a neighborhood for architectural features, and preserving these impressions of travel, which most of us lament to find so fugitive, with astonishing exactitude. He was no linguist, and French was the only language in which he could even make his wants understood. Although so much in Germany in his youth, he could speak no German. When he was travelling he always left a place, if any one staying in the hotel spoke to him. He had no wish to be competent in modern languages; he used to say: "Between you and me and the post, I hate a foreigner," and when exotic persons of distinction threatened to visit Brasenose, Pater used to disappear until he was sure that they had gone. He loved the north of France extremely, and knew it well. He was always planning a series of studies on the great ecclesiastical towns of France, yet wrote no more than a couple of these — on Amiens and on Vézelay. So eagerly did he prosecute these holiday tours, that he habitually overwalked himself, thus losing much of the benefit which he might otherwise have gained from the only form of exercise he ever indulged in. I note, in a letter of 1877, describing a visit to Azay-le-Rideau, this characteristic sentence: "We find always great pleasure in adding to our experiences of these French places, and return always a little tired indeed, but with our minds pleasantly full of memories of stained glass, old tapestries, and new wild flowers." These excursions rarely extended further than the centre of France, but once, I think in 1882, Pater went alone to Rome, and spent the winter vacation there. He could ill endure exciting travel, or too rapid hurrying from one impressive place to another. His eye absorbed so slowly, and his memory retained what he saw so completely, that to be shown too much was almost physical pain to him, and yet he was always inflicting it upon himself.

Some time after I knew him first, that entertaining skit, "The New Republic," was produced, and achieved great popular success. Pater had his niche in this gallery of caricatures, under the title of Mr. Rose. It has been represented that he suffered violent distress from this parody of his style and manner, that it caused him to retire from society, and to abandon the prosecution of literature. Nothing in the world could be further from the truth. He thought the portrait a little unscrupulous, and he was discomposed by the freedom of some of its details. But he admired the cleverness and promise of the book, and it did not cause him to alter his mode of life or thought in the smallest degree. He was even flattered, for he was an author much younger and more obscure than most of those who were satirized, and he was sensible that to be thus distinguished was a compliment. What he liked less, what did really ruffle him, was the persistence with

which the newspapers at this time began to attribute to him all sorts of "æsthetic" follies and extravagances. He said to me, in 1876: "I wish they wouldn't call me 'a hedonist;' it produces such a bad effect on the minds of people who don't know Greek." And the direct result of all these journalistic mosquito-bites was the suppression of the famous "Conclusion" in the second (1877) edition of his "Renaissance."

The source of his very long silence, for twelve years divided his second book from his first, I hardly know, unless it be attributed to the painful slowness of his methods of composition, and his extreme solicitude for perfection of style. At last, in February, 1885, was published his romance of "Marius the Epicurean," the work by which, I believe, Pater will pre-eminently be known to posterity. In the mean time had appeared, in the *Fortnightly Review*, several of those Greek studies, on Demeter and Persephone, on the marbles of Ægina and the like, which Mr. Shadwell now promises in a posthumous volume; "The Child in the House," too, in its earliest form, belongs to 1878, though first published as a book in the summer of 1894. The success of "Marius" was as great as that of a book so grave and strenuous could be. In 1887 Pater followed it by a series of four "Imaginary Portraits," studies in philosophic fiction, one of which, "Denys l'Auxerrois," displays the peculiarities of his style with more concentrated splendor than any other of his writings. In 1889 he collected some of his miscellaneous critical studies into a volume called "Appreciations, with an Essay on Style." In 1893 he published his highly finished college lectures on "Plato and Platonism" in a volume of rare dignity and humanistic beauty. Finally, in the early summer of 1894, "The Child in the House" was issued from the Oxford Press of Mr. Daniel, as a precious toy for bibliomaniacs. This list of publications practically resumes the events in Pater's life through twenty years.

During that period the household was moved once, in 1886, to Kensington, and again, in 1893, back to Oxford, where he fitted up a house in St. Giles. But, all the while, Pater's real home was in his rooms at Brasenose, where he passed a quiet, cloistered, and laborious existence, divided between his college duties and his books. His later years were comforted by a great deal of consideration and affection from those around him; noiseless, as he was, and in a sense unexhilarating, he became increasingly an object of respectful admiration to young Oxford men, whom, on his part, he treated with the most courteous indulgence. Of this generation, one disciple came to proffer a tribute of hero-worship, and remained to become an intimate friend; this was the Rev. F. W. Bussell, now fellow of Brasenose, whose tender solicitude did much to render the latest of Pater's years agreeable to him. Pater acted for some time as dean and tutor of his college, entering assiduously into the councils and discipline of the society, but he never accepted, if indeed it were ever offered, any university office. He shrank from all multiplication of responsibility, from anything which should break in upon the sequestered and austere simplicity of his life. As time went on, a great change came over his relation to religious matters. When I had known him first he was a pagan, without any guide but that of the personal conscience; years brought gradually with them a greater and greater longing for the supporting solace of a creed. His talk, his habits, became more and more theological, and it is my private conviction that, had he lived a few years longer, he would have taken orders and a small college living in the country.

Report, which found so much to misrepresent in a life so orderly and simple, has erred even as to the place and occasion of his death. He was taken ill with rheumatic fever in the month of June, 1894, being, as he remained to the end, not in college, but with his sisters in their house in St. Giles. He was recovering, and was well enough

to be busy on a study on "Pascal," which he has left nearly completed, when, in consequence of writing too close to an open window, pleurisy set in and greatly reduced his strength. Again he seemed convalescent, and had left his room, without ill effect, on July 29, when, repeating the experiment next day, the action of the heart failed, and he died, on the staircase of his house, in the arms of his sister, at ten o'clock on the morning of Monday, July 30, 1894. Had he lived five days longer, he would have completed his fifty-fifth year. He was buried, in the presence of many of his oldest friends, in the beautiful cemetery of St. Giles at Oxford.

III.

WHEN Pater was first seized with an ambition to write, the individuals of his own age with whom he came into competition were mainly poets. Those were the early days of Gabriel and Christian Rossetti, of Morris, of Swinburne; and most of the still younger men made their first steps in the field of verse, however far they might afterwards diverge from it. Pater, in this nest of singing-birds, resolved to be in prose no less painstaking, no less elaborate, no less bound by rule and art than the poets were. He is to be distinguished from those who had so much to say that their speech was forced out of them in a torrent, nor less from those whose instinct led them to bubble forth in periods of a natural artless grace. If we take these symbols of a mountain-stream or of a fountain for other prose-writers who have won the ear of the public with little effort, then for Pater the appropriate image seems the artesian well, to reach the contents of which, strata of impermeable clay must be laboriously bored. It was not that there was any lack of material there, nor any doubt about the form it must take when it emerged, but that it was so miraculously deep down and hard to reach. I have known writers of every degree, but never one to whom the act of composition was such a travail and an agony as it was to Pater.

In his earlier years the labor of lifting the sentences was so terrific that any one with less fortitude would have entirely abandoned the effort. I recollect the writing of the opening chapters of "Marius," and the stress that attended it — the intolerable languor and fatigue, the fevers and the cold fits, the grey hours of lassitude and insomnia, the toil as at a deep petroleum well when the oil refuses to flow. With practice, this terrific effort grew less. A year ago I was reminding him of those old times of storm and stress, and he replied, "Ah! it is much easier now. If I live long enough, no doubt I shall learn quite to like writing." The public saw the result of the labor in the smooth solidity of the result, and could suppose, from the very elaboration, that great pains had been taken. How much pains, very few indeed can have guessed.

It may be of interest to record the manner in which this most self-conscious and artistic of prose-writers proceeded. First of all, another pretty fable must be knocked on the head. It has been said, and repeated, that Pater composed his best sentences without any relation to a context, and wrote them down on little squares of paper, ready to stick them in at appropriate and effective places. This is nonsense; it is quite true that he used such squares of paper, but it was for a very different purpose. He read with a box of these squares beside him, jotting down on each, very roughly, anything in his author which struck his fancy, either giving an entire quotation, or indicating a reference, or noting a disposition. He did not begin, I think, any serious critical work without surrounding himself by dozens of these little loose notes. When they were not direct references or citations, they were of the nature of a *memoria technica*. Here is an example: —

Something about the gloomy Byzantine archit., belfries, solemn night come in about the birds attracted by the Towers.

Here is another: —

? did he suppose predestination to have taken place, only *after* the Fall?

These papers would be placed about him, like the pieces of a puzzle, and when the right moment came the proper square would serve as a monitor or as a guide.

Having prepared his box of little squares, he would begin the labor of actual composition and so conscious was he of the modifications and additions which would supervene that he always wrote on ruled paper, leaving each alternate line blank. Mr. Austin Dobson reminds me that Goldsmith did the same. On this broad canvas of alternate lines, then, Pater would slowly begin to draw his composition, the cartoon of what would in time be a finished essay. In the first draft the phrase would be a bald one; in the blank alternate line he would at leisure insert fresh descriptive or parenthetical clauses, other adjectives, more exquisitely related adverbs, until the space was filled. It might then be supposed that the manuscript was complete. Far from it! Cancelling sheet by sheet, Pater then began to copy out the whole —as before, on alternate lines of copy-book pages; this revise was treated in the same way—corrected, enlarged, interleaved, as it were, with minuter shades of feeling and more elaborate apparatus of parenthesis.

No wonder that certain disadvantages were attendant upon the excessive finish of such a style. It is not possible to work in this way, with a cold hammer, and yet to avoid a certain deadness and slipperiness of surface. Pater's periods, in attaining their long-drawn harmony and fulness, were apt to lose vigor. Their polish did not quite make up for their languor, for the faintness and softness which attended their slow manipulation. Verse will bear an almost endless labor of the file; prose, as the freer and more spontaneous form, is less happy in subjection to it. "What long sentences Plato writes!" Pater says in his "Platonism," and no doubt Plato might return the compliment. The sentences of the Oxford critic are often too long, and they are sometimes broken-backed with having had to bear too heavy a burden of allusion and illustration. His style, however, was his peculiarity. It had beautiful qualities, if we have to confess that it had the faults of those qualities. It was highly individual; it cannot be said that he owed it to any other writer, or that at any period of his thirty years of literary labor he faltered or swerved from his own path. He was to a high degree self-centred. Pater did not study his contemporaries; last summer he told me that he had read scarcely a chapter of Mr. Stevenson and not a line of Mr. Kipling. "I feel, from what I hear about them," he said, "that they are strong; they might lead me out of my path. I want to go on writing in my own way, good or bad. I should be afraid to read Kipling, lest he should come between me and my page next time I sat down to write." It was the excess of a very native and genuine modesty. He, too, was strong, had he but known it, strong enough to have resisted the magnets of contemporary style. Perhaps his own writing might have grown a little simpler and a little more supple if he had had the fortitude to come down and fight among his fellows.

IV.

WALTER PATER was one of those discreet spirits who, like Gray, "never speak out." He was cautious, reserved, and shy in his relations even with his friends; he seemed to possess no medium through which to approach them very closely. An extremely affectionate disposition took the place of expansiveness, and the young people who in later years gathered around him mistook the one for the other. Each found in Pater what he brought; each saw in that patient, courteous, indulgent mirror a pleasant reflection of himself. The inaccessibility of Pater is another of those fables which has to be destroyed; no one was less a hermit, no one was more easily amused or better pleased to bid a congenial companion welcome. He was an assiduous host, a gracious listener; but who could tell what was passing behind

those half-shut, dark grey eyes, that courteous and gentle mask? He liked the human race, one is inclined to say, liked its noise and neighborhood, if it were neither too loud nor too near, but his faith in it was never positive, nor would he trust it to read his secret thoughts.

I have already suggested his likeness to Renan in the attitude of his mind. The great Frenchman has described, in his autobiography, the tendency which led him to refrain from opposition and argument, and to bow the head in the conversational house of Rimmon. Walter Pater had these concessions, mere escapes of the soul from undue pressure, and he had, too, quite unconsciously, some of the very tricks of speech of Renan — especially the "no doubt" that answered to the Frenchman's incessant *n'en doutez pas*. With natures like his, in which the tide of physical spirits runs low, in which the vitality is lukewarm, the first idea in the presence of anything too vivacious is retreat, and the most obvious form of social retreat is what we call "affectation." It is not to be denied that, in the old days, Pater, startled by strangers, was apt to seem affected; he retreated, as into a fortress, and enclosed himself in a sort of solemn effeminacy. It was, at its worst, mild in comparison with what the masters of preposterous behavior have since accustomed us to, but it reminded one too much of Mr. Rose. It was put on entirely for the benefit of strangers, and to his inner circle of friends it seemed like a joke. Perhaps in some measure it was a joke; no one could ever quite tell whether Pater's strange *rictus* was closer to laughter or to tears.

A nature so enclosed as his, so little capable of opening its doors to others, must have some outlet of relief. Pater found his outlet in a sort of delicate, secret playfulness. There are animals which sit all day immovable and humped up among the riot of their fellows, and which, when all the rest of the menagerie is asleep, steal out upon their slip of greensward and play the wildest pranks in the light of the moon. Pater has often reminded me of some such armadillo or wombat. That childishness which is the sign-manual of genius used to come out in the oddest way when he was perfectly at home. Those who think of him as a solemn pundit of æsthetics may be amazed to know that he delighted in very simple and farcical spectacles and in the broadest of humor. His favorite among modern playwrights was Mr. Pinero, and I shall never forget going with him to see "The Magistrate," when that piece was originally produced. Not a schoolboy in the house was more convulsed with laughter, more enchanted at the romping "business" of the play, than the author of "Marius." He had the gift, when I knew him first, of inventing little farcical dialogues, into which he introduced his contemporaries; in these the rector of Lincoln generally figured, and Pater had a rare art of imitating Pattison's speech and peevish intonation. One playful fancy, persisted in so long that even close and old friends were deceived by it, was the figment of a group of relations — Uncle Capsicum and Uncle Guava, Aunt Fancy (who fainted when the word "leg" was mentioned), and Aunt Tart (for whom no acceptable present could ever be found). These shadowy personages had been talked about for so many years that at last, I verily believe, Pater had almost persuaded himself of their existence. Perhaps these little touches will be thought too trifling to be mentioned, but I hold that they were all a part and parcel of his complex and shrouded intellectual life, and therefore not to be forgotten.

He had great sweetness and uniformity of temper, and almost the only thing that ever ruffled him was a reference to an act of vandalism committed at Brasenose while he was on the governing body. The college had a group, called "Cain and Abel," cast in lead, a genuine work by John of Bologna. For some reason or other this was thought inconvenient, and was sold for old lead, a somewhat barbarous pro-

ceeding. Pater, from indolence, or else from indifference to late Italian sculpture, did not stir a finger to prevent this desecration, and in later years a perfectly unfailing mode of rousing him would be to say, artlessly, "Was there not once a group by John of Bologna in the college?" However sunken in reverie, however dreamily detached, Pater would sit up in a moment, and say, with great acidity, "It was totally devoid of merit, no doubt."

Pater showed much tact and good sense in his attitude towards the college life. He lectured rarely, I believe, in later years; in the old days he was an assiduous tutor. His temperament, it is true, sometimes made it difficult to work with him. On one occasion, at the examination for scholarships, he undertook to look over the English essays; when the examiners met to compare marks, Pater had none. He explained with languor, "They did not much impress me." As something had to be done, he was asked to endeavor to recall such impressions as he had formed; to stimulate his memory, the names were read out in alphabetical order. Pater shook his head mournfully as each was pronounced, murmuring dreamily, "I do not recall him," "He did not strike me," and so on. At last the reader came to the name of Sanctuary, on which Pater's face lit up, and he said, "Yes; I remember; I liked his name." My friend, Dr. Henry Jackson, gives me an anecdote which illustrates a more practical side to his character. In 1870, having just begun to lecture at Trinity, our Cambridge Platonist found himself seated next Pater at dinner in Brasenose. He said to him: "I believe you lecture constantly on 'The Republic.' How do you get through it in time? It seems as though lecturing three times a week for three terms, it would be impossible to deal adequately within a year with all the problems and the fallacies." "Oh!" said Pater, "I always begin by telling them that Socrates is not such a fool as he seems, and we get through nicely in two terms." He grew more and more inclined to take an indulgent view of the young people. A year or two ago, I remember his saying, when somebody asked him whether the horse-play of the undergraduates did not disturb him. "Oh! no; I rather enjoy it. They are like playful young tigers, that have been fed." He was not a "progressive;" our friend the Bishop of Peterborough recalls a serious discussion in common-room at Brasenose, on the burning subject of university reform. Pater interposed in the thick of the fray with the somewhat disconcerting remark, "I do not know what your object is. At present the undergraduate is a child of nature; he grows up like a wild rose in a country lane; you want to turn him into a turnip, rob him of all grace, and plant him out in rows." And his remark, concerning bonfires in the quad, that they lighted up the spire of St. Mary's so beautifully, will long be remembered.

The perennial conflict in his members, between his exquisite instinct for corporeal beauty on the one hand and his tendency to ecclesiastical symbol and theological dogma on the other, is the secret, I think, of what made the character of Pater so difficult for others to elucidate, in some measure also so painful and confusing for himself. He was not all for Apollo, nor all for Christ, but each deity swayed in him, and neither had that perfect homage that brings peace behind it. As Alphonse Daudet says of some thinker, "Son cerveau était une cathédrale désaffectée," and when he tried, as he bade us try, "to burn always with the hard, gem-like flame" of æsthetic observation, the flame of another altar mingled with the fire and darkened it. Not easily or surely shall we divine the workings of a brain and a conscience scarcely less complex, less fantastic, less enigmatical, than the face of Mona Lisa herself. Pater, as a human being, illustrated by no letters, by no diaries, by no impulsive unburdenings of himself to associates, will grow more and more shadowy. But it has seemed well to preserve, while still they are

attainable, some of the external facts about a writer whose polished and concentrated work has already become part of the classic literature of England, and who will be remembered among the writers of this age when all but a few are forgotten.

EDMUND GOSSE.

From The Argosy.

A MYSTERY OF MODERN FLORENCE.

MARGARET MERRITON lived with an aunt in Florence; her Italian mother had died when she was a child; from her she inherited dark hair and eyes and a picturesque southern look. She had been educated in Italy and spoke the language without an accent.

Miss Merriton the elder was very different; like many English people, she accepted every advantage afforded her by life in the "city of flowers," with complacency, yet abused foreigners and foreign ways freely, and ascribed any shortcomings on her niece's part to the Italian blood in her veins. She was something of a character; she rented a charming little apartment on the Lung 'Arno and had furnished it with great taste; she was not altogether pleased when her brother died, and she felt bound to adopt his daughter; it rather deprived her of an air of Bohemian independence which she loved. She had been wont to say that in Florence a single woman could live alone without any thought of *les convenances*, for at any rate, if of a certain age and unmarried, no one would give them the credit of being respectable; which was about true.

It must not be thought that she aired such sentiments before her niece, for although the latter was three-and-twenty, she treated her as a child, and Margaret went her own way, wandered about the old town, and made a companion of Nina, the good-natured, talkative little maid.

The girl led a happy life on the whole; the charm that especially belongs to Florence the fair, had closed round her; its history was at the tips of her fingers; every house, every street told her some old-world story, and the kindly Tuscans were her friends; it required but a small effort of imagination on her part to transform them into heroes and heroines of ancient Florentine romance.

One afternoon she strolled into the baptistery and sat down to rest in the cool old building, watching with amusement and interest the ceremony of the baptism of one-day-old infants. It was a strange sight and certainly a very funny one; the grandeur of the stately edifice and the dignity of the solemn priest contrasted curiously with the rather dirty acolyte holding a guttering taper, and the old woman who mechanically stood the small, tightly swaddled, new-born mummies one after another upon the edge of the beautiful font, where with their wizened, puffy red faces, they looked like the sugar *bambini* off a Christmas tree.

The murmur of the priest and the sharp responses of the acolyte echoed round the marble walls, and the old woman sniffed audibly. She was evidently a professional lady who undertook to officiate on such occasions at so much the half-dozen.

An old man was her only companion, and he resignedly seized each baby as it was handed down and promptly obliterated all remains of the holy water or oil by the use of a large puff charged with abundant powder.

Several people had entered; a woman seated herself near Margaret and seemed at first absorbed in prayer, but presently she stared fixedly at her until the girl began to think she was going to beg from her, for well-dressed beggars are common in Italy. Her intention, however, was different; she came up to her and whispered: —

"The signorina will pardon a stranger, but the signorina looks pale; she must be ill."

"Thank you," said Margaret, a little surprised; "I am only tired."

"Allow me to offer the signorina my salts," the woman continued kindly, and she pressed upon her a small cut-

glass bottle from which she had removed the stopper. A strong, pungent smell was apparent; Margaret began to think her new friend was right; she did feel dizzy and uncomfortable. Probably the incense and the closeness of the baptistery had produced this effect upon her, tired as she was.

"Thank you, thank you," she heard herself say as if she were another person, for her own voice sounded far away.

"Ah, let me fan the signorina; let me put this handkerchief to the signorina's face," she thought the woman continued, and then a cloud came over her and there was a buzzing in her ears; she fell, fell — into space; sunny space, with a noise as of birds in springtime, and a fluttering of pink blossoms among fleecy clouds. She experienced a sense of joyous freedom from all earthly trammels, as if her spirit had mounted on the incense and was winging its way to the golden gates, of which Lorenzo Ghiberti's are but a base imitation.

This beatific state did not last long, however. She woke to life again with a strange tingling and a sense of distant sounds coming nearer and beginning to explain themselves and mean something. Where was she? At length she became conscious enough to realize that she was lying in a covered litter and was being carried through the streets; the steady tramp of men's feet told her so much; a wild terror seized upon her; she cried out. In a moment the curtain at her side was lifted and she saw the well-known figure of a brother of the Misericordia.

To those who are not familiar with Florence there may seem nothing much more terrifying and mysterious than these silent, black-robed men, whose eyes appear to glitter maliciously through the slits in their weird hoods; but to Margaret the sight was only reassuring, for like all Florentines she looked upon the "Frati" as angels of charity and mercy, in spite of their satanic garb.

The brother spoke in a low voice.

"Do not be afraid, signorina," he said in good high-bred Italian. "You fainted, and we are taking you to safety; no one shall harm you, be assured; but you must not speak; in a few minutes we shall have reached our destination."

She was a sensible and a brave girl; she did as she was bid, sure that they were carrying her to a hospital, from whence she could at once drive home in a cab. She still felt sleepy, and found herself wondering as she closed her eyes again what exception to the rule of enforced silence could have allowed the brother to speak to her. She was awakened the next time by a touch on the arm. The litter had been placed on the ground, and she saw that she was in a courtyard with a large archway on one side of her, beneath which were closed wooden doors. Over this archway hung a coat of arms almost worn away, and in a corner under a grim cypress-tree stood a stone well and several burnished copper water-pots. Round her were the brothers of the Misericordia. Silently they helped her to alight and as silently led her through an iron gate, along a passage. No one came to meet her, but as she passed into another and smaller court, her eyes fell on a girl who was standing in a doorway, a very beautiful girl, evidently a lady, but dressed in a simple, shabby grey gown. She had dark, soft eyes and a dusky skin, but rich, golden hair which grew low on her forehead, and the combination was very striking. What impressed Margaret more than anything was the expression in her face as she gazed at her; curiosity and animosity were prominent; her lids were heavy and tear-stained; she was apparently in great trouble; directly she saw that the other had noticed her she vanished; the Frati, too, having done their work, placed Margaret on a chair and departed, closing and locking the door behind them.

The second court was a little oasis among the grey walls; it was cloistered, and in the midst was another carved-stone well with wrought iron accessories. Round it grew orange and

lemon trees and a profusion of sweet flowers; several white pigeons fluttered to and fro in the last rays of the sun, which shot across the red roofs and glistened on the yellow and blue of a half broken Luca della Robbia, a meek-eyed Madonna with a cherubic bambino and angels to match. At any other time Margaret must have been struck with the beauty and harmony of the scene, but she was beginning to experience a certain disquietude.

Presently she heard the sound of a key being turned in a lock; a door in the wall opposite opened and a young man entered. He crossed the smooth piece of turf quickly; and as she rose to her feet he stood before her, bowed in the most approved Italian style, and presented her with a visiting-card.

She was too much disturbed and excited to be struck with the humorous side of the proceeding, or to feel that this was a very prosaic termination to an adventure which seemed to contain all the elements of a mediæval romance. She crushed the card in her hand without looking at it, and exclaimed indignantly: —

"I am at a loss to understand, signor, why I have been brought here. Am I in a hospital? What is the meaning of this mystery? Will you kindly explain?"

The young man certainly did not look like the superintendent of a hospital. He was tall, decidedly handsome, and bore that air of breeding which often covers nationality and announces a gentleman of birth without stamping him as English, French, German, or Italian. However, he spoke in the soft, musical Tuscan tongue. Margaret saw to her surprise that he was even more embarrassed and agitated than she was herself.

"Contessina," he said, "I ask of you a thousand pardons. I feel I have little to say in excuse. I am a desperate, a most unhappy man. I have thought of every other expedient, but only a personal interview could help me."

"What do you mean?" cried Margaret.

"I mean," he continued, "that I confess to having managed this meeting between us, in order that I may conjure you to listen to me as you would to one at the point of death, for ruin is before me, and you alone can save me."

For a moment the earnestness of his manner made the girl forget her fear; it passed through her mind that by some people her aunt was thought rich, and that Italians always have an exaggerated idea of the wealth of English people. This man was evidently in great trouble; perhaps debt was weighing him down and he had had recourse to this extraordinary method of begging for help.

Rather to her surprise she found herself asking: —

"What do you want me to do?"

"I want you to say you will marry me!" he cried, in great excitement. Nothing in the world could have amazed her more than this most unexpected answer, but before she could say a word, he went on, speaking eagerly, passionately, the liquid Italian varying with and accentuating every expression of feeling, as only Italian can.

"The priests have come between us; how is it otherwise that I know you only by sight? Perhaps you are even unaware of the fact that our parents were true and devoted friends, and that they arranged the marriage. All I ask of you is to fulfil the contract of which you have probably remained in ignorance, to let no foreign influence destroy what was made fast in love and friendship. Nothing but the thought of this could have made the trick I have played you permissible; but what could I do? It is not for my sake alone I plead, but for my mother, whose proud head is bowed with grief and misery, for the honor of my house. Ah, contessina, you cannot be so hard as to refuse? Your face is kind and sweet."

Margaret had staggered back against the pillar; her white dress had caught fast on a rose-briar which entwined it; her hat had fallen off. In this position

she was still, one hand half raised as if in protest.

"Oh, you are mistaken!" she cried. "You are mistaken! Stop! let me go!"

She began to be alarmed; many wild thoughts rushed through her brain. Was he mad? Had her father indeed made some promise of the kind in her infancy? Was it a mere trick, or a case of mistaken identity?

"You are frightened," he said. "I am rough, I am boorish, and I speak not of love. Ah, how can I? You would not believe me if I did. It is too real, I am too desperate. But as children we were friends. Maria mia, believe me if you will, but consent to brave the priests for my sake; the devotion of my life shall be given to you; you shall learn to love me. Can you indeed allow a party feeling to come between us? an unjust tyranny? My father sided with the king, your aunt is ultramontane, under the influence of the priests. Have pity! Have you none for the man who as a child stood at your father's knee, who humbles himself before you, who will find it easy to love you?"

Now Miss Merriton the elder was an ardent supporter of the Evangelicals in Florence, and an inveterate enemy of the Anglican Ritualists. Her niece's hair almost stood on end at this startling announcement. For a moment she wondered if her aunt could possibly be a female associate of the great Society of the Jesuits. But another solution of the puzzle suggested itself, and the name Maria by which he had called her was a clue. She interrupted the young man's torrent of words, and drew away her hand which he had taken.

"My aunt is not even a Catholic," she cried. "You are mistaken, I tell you. Let me go. You have no right to detain me; you have no right to play such a trick on any one. My name is not Maria, and I know nothing about you. Let me go at once!"

"You are *not* Maria!" he exclaimed, turning on her; "you can deny that? You may not know *me*, contessina, but I know your face well, have seen it many times. And can you indeed be so cold and unforgiving? Think, remember, that my house has been impoverished to save yours. When your father took help from the hand of his friend, he thought to offer his only daughter to that friend's son would be but a just return. Is all this nothing to you? nothing? Do you deny that you went to the baptistery to-day by appointment to meet your dressmaker, who did not come? Do you deny that your name is Maria Elvira — Elvira after my own mother?"

"I do deny it!" cried Margaret — driven to desperation. She looked round and realized that although the pigeons were flying so freely backwards and forwards over the roof, and the sun was shining cheerfully into the pleasant little court, she was as much a prisoner within its walls as if the iron bolts and bars of a jail kept her from the outer world.

"I do deny it," she repeated. "I am not the person you take me for; I am not Maria Elvira; I did not go to the baptistery to meet my dressmaker. You have no right to detain me; send for a cab. I will submit to this no longer."

Her words were brave, but she was in an agony of fear, and the tears were very near her eyes.

At last she seemed to have produced some effect upon him. He grew very pale and gave her a look that haunted her for long afterwards; the look of a man suffering from injustice and baffled in an unexpected way. He drew himself up: —

"I am punished, contessina," he said, "for having allowed myself to employ means which at another time I should have disapproved. The gravity of the situation alone drove me to it. *You are not Maria Elvira;* I am answered. There is only one chance more; you will perhaps listen to the entreaties of a heart-broken mother, who wrongly blames herself for the trouble which has fallen upon us."

He bowed, and walking swiftly across the grass-plot, disappeared

through the door by which he had entered. Something attracted Margaret's attention; the click of the lock which had accompanied his entrance was missing; he had forgotten in his haste to turn the key upon her. In an instant she was at the door and on a terrace in front of a high stone house with steep steps leading up to it; on the farther side was a corresponding door through which she passed, finding herself in a large, wild, overgrown garden, full of orange-trees. She did not take long to reach the other end, and after running up against a gardener, who exclaimed, "Corpo di Bacco," but took no further notice, she escaped through a small gate into vineyards, where she wandered for some time until she reached a lane. She then stopped to get breath, and began to consider in which direction lay the town. Being between walls she could not see Giotto's Campanile and the Duomo, nor the turreted tower of the Palazzo Vecchio. It was now for the first time that she noticed the card which was still in her hand. She unrolled it from its crumpled state and read, "Marchese Carlo Barberino del Santorre."

She hurried on, fearing that she might be pursued, and before long met an old man with a bunch of wallflowers in his hand. He was evidently a market-gardener, and told her if she continued her walk down several lanes, she would at last come to the Spedale degli Innocenti; this was the case, and before long she turned under the arch of the foundling hospital into the piazza.

From there it was but a short way home, but seeing people staring at her, she went into a shop and asked leave to put her hat straight.

Margaret knew the kindly Tuscans. The woman at once took her into an inner room and smilingly produced a looking-glass which she said belonged to her daughter Teresa, who would be proud to think it had been of use to the signorina.

It was only when the girl entered Vieusseux's library in order to provide herself with a necessary excuse for her long absence, that she began to realize fully what had happened to her.

Miss Merriton revelled in French novels, but would not allow her niece even to open them. Margaret, therefore, selected "Dr. Thorne," hoping it might satisfy her aunt's prejudices, and then went home.

Miss Merriton was lying on the sofa with a novel and a headache; she was rather cross, a friend had dropped in to tea and had disagreed with her in two senses of the word. "Where have you been all this time?" she asked.

"I went to Vieusseux's," said Margaret evasively, holding up her book.

"Three hours at Vieusseux's!"

Three hours! was it possible she had only been away three hours!

"I—I went into the baptistery and fell asleep there and—and dreamed—oh, such a curious dream," said the girl.

"Humph! I should say your bed was a better place to dream in," answered Miss Merriton shortly. "I can't have you gallivanting all over the town alone and sleeping in baptisteries."

Margaret did not answer. She bent over her book; she read pages of "Dr. Thorne" that evening, but not one word of it entered her brain. Some years afterwards when she chanced to come upon it in a friend's house, the sight of it caused her a strange sensation as of a troubled nightmare suddenly remembered.

She said nothing to her aunt about her adventure. Of what use, she argued; she would only take alarm and restrict her freedom; as it was, she more often obliged her to accept Nina's company in her walks. Margaret felt, too, the very suggestion that she, Miss Merriton senior, could be an ultramontane, would fire her indignation and curiosity to the extreme; she might insist on probing the mystery to the heart and discovering all that could be discovered.

And why not? some will say. That question Margaret could hardly answer. She thought a great deal of the little

sunny courtyard where such a strange scene had taken place between her and the Marchese Barberino del Santorre, with only the pigeons as witnesses; but the more she thought the less could she arrive at any conclusion.

Had it after all been a good piece of acting, a mere trick, such as was sometimes played she had heard for a wager by the young sprigs of nobility about the Austrian and Italian courts? Yet the remembrance of the young man's earnestness, his pale face and haggard eyes, almost negatived this idea.

Now and then the vague surmise again haunted her that her father might have had, through her mother, who was of noble birth, some connection with the Barberini. It was on these occasions that she was guilty of watching her aunt furtively, and meditating whether she could actually be a Jesuit in disguise. The possibility of this struck her chiefly when Miss Merriton's nose looked particularly pointed and red, and when she glanced sharply at her over her eyeglasses; but she was wronging the Jesuits, not knowing that in most cases they are polished gentlemen and gentlewomen with suave and courteous manners.

At other times she wondered if there existed a real Maria Elvira, who was indeed kept by the priests for political and religious reasons from the man to whom she had been betrothed in infancy. She spent much time in conjectures as to what this girl was like, should there be such a person; and how she would have acted had she been in her place as intended. Would *she* have remained proof against the passionate pleading and the sad, dark eyes of the young marchese?

Margaret felt she had taken an unwilling part in an unsuspected drama that was being played out in the old city; a tragedy in which love, politics, religion, and broken hearts had their part as much as if a Medici had pulled the strings.

One day, about a month after these events, she noticed Nina making mysterious signs to her from behind her aunt's sofa. As soon as she left the room the little maid ran after her with a note.

"A man brought it, signorina," she said, laughing, "and told me to give it into the signorina's own hand."

"I don't know why that should be necessary," said Margaret coldly, thinking it right to suppress Nina's ardor; but not until she was alone did she break the seal which bore the single letter B., and read the following words written in Italian: —

"A happy bridegroom offers a thousand apologies to the fair English lady for a most regrettable and unpardonable mistake."

Nothing more. The color flew to her face, she sighed and then smiled. So it had not been a joke, and he had gained his end; the cloud had been lifted from the house of Santorre. She wondered if he had repeated the experiment after having discovered his error, and so won the victory.

Two mornings later Nina mentioned that a very grand wedding was to take place at one of the fashionable churches.

"The bride is the rich and beautiful Contessina Maria Elvira Ortelli, who has not long returned from the Convent of the Assumption at Rome."

"Maria Elvira!" exclaimed Margaret, "*Maria Elvira!* And who is she to marry?"

"Ah, I know it not, signorina, but a cavalier young and handsome. It was the woman at the lace shop told me that her trousseau is magnificent; six petticoats with real valenciennes, and the wedding dress trimmed with exquisite duchesse point."

"Is she so wealthy, then?"

"Ah yes, signorina; she is an heiress and has large possessions. The sister-in-law of my cousin Luigi is in service with her aunt. Mio! it must be wonderful to be rich, beautiful, and a bride!"

"We will go, then, and see them come out of church," said Margaret, much to the delight of the handmaiden.

After a little grumbling at their fri-

volity, they obtained Miss Merriton's permission and sallied forth.

In front of the church a great many smart carriages were waiting, and a fairly large crowd had assembled.

The two girls approached the door as nearly as they could, and after a time there was the sound of music; the crowd swayed, shouted "La Sposa," and the hero and the heroine of the day emerged from the church.

Margaret hardly heard Nina's exclamation, "Cielo, what beauty! But oh, how she resembles the signorina! It is a miracle!"

She was looking at the bridegroom; he had turned in her direction and was bowing and smiling to his friends. He was utterly unknown to her, a short, rather stout man, bald and very Italian, with a Victor Emanuel moustache and imperial. She turned away and leaned against the wall of the church; she felt faint.

"Ah, signorina!" cried Nina; "come, come; the heat is great, the crowd is unmannerly, and we have seen all that is to be seen. Ah, to be rich, beautiful, and a bride!"

. . . . . .

A year later Margaret found herself again in the baptistery, this time accompanied by the faithful Nina. No wholesale baptisms were taking place that day, but a solitary infant was being received into the church. As usual she watched with interest, and noticed the tiny, delicate, refined face of the baby. When the ceremony was over she approached and looked at it more closely.

"To whom does the sweet bambino belong?" asked Nina, with her usual curiosity. The servant, a girl of the dark-eyed, rosy-cheeked, chubby, Florentine type, replied rather curtly:—

"The parents are happy, though poor."

Her words and the tone in which they were spoken, sounded like a half-defiant apology for the extreme simplicity of the child's clothes; the pillow on which it lay was devoid of all lace and furbelow. She spoke in a low voice to the old woman who was with her, as if to avoid further conversation, but Nina was irrepressible.

"And the name?" she persisted. The servant was obliged to reply to so direct a question; she answered in the same tone and drew her charge to her breast as if to shield it from inquisitive strangers.

"It is the child of the Signor Carlo Barberino, painter."

Margaret was silent, she looked round the time-worn building, at the majestic font and at the innocent baby face. A mist as of tears came over her eyes. Then she bent and kissed the tiny forehead and passed out into the sunlit piazza.

From The Fortnightly Review.

THE CRIMEA IN 1854 AND 1894.

BY GENERAL SIR EVELYN WOOD, G.C.B., V.C.

SIX years ago, by the generous hospitality of an esteemed friend, I was enabled to visit, with great comfort and in congenial company, Albuera, Badajoz, Corunna, Gibraltar, and Torres Vedras, all memorable for a soldier, besides many other places of interest for the ordinary traveller. When, therefore, I was invited to revisit the Black Sea and the Crimea, where forty years ago as a midshipman I spent eighteen exciting and happy months, in spite of many attendant discomforts, I gladly accepted the offer; and receiving my "sailing orders" for the 12th of August, it occurred to me to look out in my journal where I was, and what we were doing on the 12th of August, 1854. Therein I read, "H.M.S. Queen at sea. Last night H.M.S. Trafalgar stood under our stern, and asked for medical assistance." We had known for some weeks that cholera was raging in Bulgaria, and we had heard dismal accounts of its ravages amongst our soldiers, but it was on the 10th of August that the outbreak of cholera in the fleet became generally known, and the Trafalgar, with two other infected ships, sailed for a short cruise.

On the morning of the 12th the

combined fleets, till then anchored in Baljic Bay, put out to sea, to endeavor to shake off the sickness which was sapping the strength of the army.

Before I proceed to write about the Crimea, it is desirable I should account for the eight months previous to our landing thereon, during which time the allied navies had virtually confined the Russian ships to the harbor of Sevastopol. From the 22nd October, 1853, when the fleet was ordered to enter the Dardanelles from Besika Bay, it remained at anchor in Beikos Bay, opposite to Therapia, till the 3rd January, 1854, when we weighed to enter the Black Sea.

Our start was not successful. The current, strong at all times, was accelerated by a fresh northerly breeze blowing down from the Black Sea, and in a few minutes there were three collisions. Possibly the steamers, which in many cases had two line-of-battle ships in tow, had scarcely sufficient horse-power for the purpose. Our ship was just in the "fair way" when Captain (later Sir Frederick Michell, seeing that the others wanted assistance, let go the towing hawser, and hailed our steamer to help those in trouble. He had commanded a corvette in 1838, and later a frigate, which were often in the Bosphorus, and knew, therefore, the current and soundings. We made four or five boards,[1] but anchored when we reached the mouth of the Black Sea, as the remainder of the fleet, delayed by accidents, had not accomplished the distance, ten miles, before a thick fog fell. No other commander attempted to follow our captain's example, though the admiral signalled "Well done, Queen." The praise was merited, as any one will understand who realizes the difficulty of a 116-gun ship tacking many times in such narrow and swift running waters.

Next morning the admiral, when steering for Sinope, made the signal, "The ships and territory of Turkey throughout the Black Sea are to be protected under any circumstances from all attacks." This exemplified the old adage of "shutting the stable door after the horse was stolen," for, on the 30th November, a Turkish squadron of eleven vessels lying at anchor in Sinope Bay, had been destroyed by Admiral Nakimoff's fleet, one vessel only escaping to carry the news to Constantinople. When four thousand Turks had been killed, England decided she would protect her faithful ally! Three Russian men-of-war were off Sinope the day before we arrived, and as we neared the point there was a false rumor of the approach of the enemy's fleet. We beat to quarters and loaded our guns, the men showing a keenness for fight which was not lessened by the sight in the bay.

Six weeks had elapsed since the action, but the Turk, though careful to bury his father with all honor, is strangely indifferent to appearances as regards other corpses, and there were many still floating in and around the wrecks, several of which had blown up.

Nothing came of this cruise, and on the 28th January we were back in the Bosphorus. . . . . .

On the 24th of March the fleets again entered the Black Sea, the admiral signalling "Russian men-of-war are to be constrained to retire to Sevastopol." After a cruise the British fleet, on the 9th April, "manned yards" and gave six cheers for the news that war was declared, repeating these cheers in concert with the French fleet on the 15th April, as our allies received the declaration of war only on that day.

On the 23rd April we anchored off Odessa, the defences of which were attacked early next morning by the steamers, which circled round, firing on the forts and docks, while all the sailing vessels except the Arethusa remained at anchor, she and our boats being employed in stopping for examination vessels which were leaving the port. H.M.S. Arethusa, a full-sized frigate, had stood in shore to intercept ships escaping along the coast. In carrying out this duty she came under the fire of a three-gun battery on the high

[1] *I.e.*, turnings about.

ground of Langeron Point, which shelters the Odessa anchorage from the southward. The Arethusa, at the moment under *all plain sail*, immediately *hove to* and sent a storm of shot and shell into the battery, from which the Russians were driven; they soon returned, however, and fought their guns bravely, but without doing the frigate any damage. The admiral now signalled, "Arethusa make sail," and filling her foresails she *wore*, firing her bow guns, then the other broadside, and later her stern guns, as she went round. Having stood off a little, she tacked, and standing in, again engaged the battery, this time first with her bow guns, then the lee broadside, till she went about and poured in the other broadside. The admiral's signal then became more peremptory, "Captain come on board," and getting into a boat he pulled to H.M.S. Britannia, while his first lieutenant stood in, and repeated the manœuvre till he was recalled in such decided terms as to admit of no evasion.

Most of us have read thrilling descriptions of ships in action under *all plain sail*, but few now alive can have seen, nor will any one ever again behold, such a beautiful scene as that which riveted our attention, drawing all eyes away from the more destructive, but prosaic, duel between our steamers and the Mole forts.

Our anxiety to fight was so great as to make every one anxious to join the draft of marines we sent to help to fight the guns of H.M.S. Terrible, by whose captain they were greatly praised.

H.M.S. Fury arrived during the bombardment, bringing despatches from Constantinople, and, crossing the admiral's bows, stood in and opened fire, but was immediately recalled, as she was again next morning, when on being ordered to reconnoitre she opened fire. The Tiger, Sampson, and Vauban began the bombardment at 6.30 A.M., followed shortly by all the other steamers, and circling round, engaged the batteries on the Mole at long range till 8 A.M., when they closed in. Though the Terrible was hulled eleven times, and the Vauban was set on fire by a red-hot shot, the loss on the side of the allies was small, but the enemy must have suffered considerably, as four magazines were blown up, and all their guns silenced.

We left Odessa Bay on the 26th April, and cruised off Sevastopol till the 6th May, when we were caught in so dense a fog as to oblige us to anchor in eighty-nine fathoms of water, not being able to see one hundred yards from the ship. The fog lasted, occasionally lifting a little, till the 12th May, when H.M.S. Tiger grounded five miles from Odessa, at 6.30 A.M., under a cliff eighty feet high, within one hundred and fifty yards of the shore, and close to the villa belonging to Mr. Cortazzi, who was mayor of the city at the time.

This high ground was then studded here and there with houses, and is now thickly built over, being a favorite suburb for merchants of the city. Though every effort was made to get the ship off, guns and stores being thrown overboard, when the fog lifted she fell an easy prey to a field battery, being set on fire in two places in less than ten minutes, when, after some loss, the captain being dangerously wounded, and his nephew mortally wounded, the Russian flag was hoisted. The disembarkation, to the great suffering of the wounded, was necessarily hurried, for, as the fog cleared off, H.M.S. Vesuvius stood in, and the Russians, who had given permission for the crew to remove all personal effects, cancelled it, and threatened to re-open fire unless all landed immediately.

No nation could have treated prisoners more generously. Officers and men were well lodged, fed, and cared for, and the wife of the general sent daily from her house, jellies, etc., for the wounded officer. Two months later most of the crew were liberated, and rejoined the fleet when it lay in Baljic Bay, the officers and a few men only being retained in Russia.

When I visited the place of the dis-

aster this year, the scene was very different. A tramcar was at the beach, from which citizens of all ages and sexes were hastening to the water; many persons were already swimming in the sheltered bay, which has recently become the favorite bathing place of Odessa, but a tree standing on a ledge of earth which has slipped from the cliff still plainly marks the spot where H.M.S. Tiger was lost.

During the first week in July my career nearly came to an end. Every evening the midshipmen, and there were twenty-five of us in mess, used to skylark, the favorite game being "follow my leader," which often ended in some one standing on the main truck. On this occasion, three of us had crawled from the main yard-arm down the brace,[1] and I was resting on the after-brace block, level with the poop, when a messmate, opening the quarter-gallery window, called out "Boo!" to startle me, which he did so effectually as to make me let go, and down I fell, forty-three feet, to the water. The lower-deck ports (the Queen was a three-decker) were open, and I just missed one, but striking my shins till they bled freely, on the swell of the ship, I had some difficulty in swimming to a boat which was moored to the stern ladder.

On the 20th July Sir George Brown and General Canrobert embarked in the flagship, and we stood across to Sevastopol, clearing for action and loading our guns before we hove-to off Fort Constantine, and then cruised up and down the coast. The Russians fired on the steamers which stood in closer, but H.M.S. Fury was the only vessel hulled, and she got a shot in the butter-cask in the midshipmen's mess store. After a good look at Balaklava we returned to Baljic Bay, where we found cherries, grapes, and plums, the latter, known as kill-Johns, in profusion. Blue-jackets were often seen carrying their trousers in their hands, with the feet tied up to hold the fruit; but Captain W. F. Burnett never allowed any to be brought on board, which possibly helped to preserve us from the epidemic which was shortly to decimate some of our ships, and cost us at that time the lives of six hundred soldiers, besides nearly a battalion from each division invalided to Scutari. The French had upwards of ten thousand rendered non-effective, of whom a large proportion died.

We went to sea to try to shake off the cholera, of which there had been a few cases, but with so little success that five days later three line-of-battle ships returned to Baljic Bay to land their sick and remain at anchor, as the men remaining effective were insufficient to work the ships — yet these ships carried crews of seven hundred to one thousand men. The soldiers suffered considerably from want of medicines, for although the government had approved in April of an attack on Sevastopol, yet in one division, on the 1st August, with cholera raging, there was no wine, brandy, arrowroot, or sago.[2] There was a small reserve at headquarters, but the medical officer in charge of the division in question had been admonished during July to demand less medical comforts, as he wanted more of one article than the whole reserve supply. The same officer, having urgently demanded a drug, was answered some days later, during which time his letter miscarried, that as it did not make an araba (country wagon) load it could not be sent unless he sent a man the few miles intervening between the division and headquarters. It apparently was not contemplated in those days that soldiers could get ill, for the battalions arriving at Gallipoli on the 15th April, when the thermometer was 28° at night, were without hospital equipment, and the sick had no mattress, and but one blanket. During the cholera epidemic we read how the medical officers complained of their sick being in want of bedding, blankets, and fuel, which rendered it impossible to maintain the animal heat

[1] The rope which hauls the sail round to catch the wind.

[2] These statements, hearsay at the time, are based on official published papers.

necessary for the recovery of the patients.

It is impossible to write of the sufferings of our soldiers during the Crimean War, without seeming to impute gross mismanagement to some or all of those whose duty it was to see that the soldier, whose life must be freely hazarded in battle to attain the end in view, should never want for any article which may enable him to live until required for battle, and in the most perfect condition attainable on service. I will therefore state at once I intend in this article to cast no reflections on any one serving in the East. Ten years before we went to the Crimea, Runjeet Singh, after seeing our men fight in the Punjaub, said: "If I owned such soldiers, I should carry them in palanquins to the field of battle, let them fight, and carry on for the next engagement any that remained alive." This sounds absurd, but he was much wiser than most Englishmen in 1854, and his plan would have been far less expensive than our haphazard economies. During a peace of forty years, the representatives of our taxpayers had insisted on reduction of expenditure in all warlike establishments.

A commissariat officer cannot learn his many duties in a few weeks, any more than a staff officer can acquire from books only, however closely he may read, that experience and knowledge essential for controlling the different units of an army, to the best advantage of the whole. A treasury clerk, however able and zealous, who has spent his service in curtailing expenditure, cannot reasonably be expected to launch out in a lavish outlay for which he has no authority, and thus incur heavy personal pecuniary responsibility, in order to provide in advance for the wants of soldiers, of which he has had no previous experience.

The medical officers were of a high social class; many had entered the service with excellent professional qualifications, but in their ordinary duties two of these men had merely the care of twenty or thirty men with simple ailments. A different department held and issued drugs, and from the replies the more ardent doctors received to requisitions, it had come to be understood that a medical officer was valued in inverse ratio to his demands for drugs, and medical comforts.

A general, however brave, however devoted to his queen and country, who for forty years had worked in an office, could not with any justice be expected to develop into what Wellington became after ten years' war service — an able adjutant-general, quartermaster-general, commissary-general, principal medical officer, and commander-in-chief combined in one person.

There was one staff officer at our headquarters in the Crimea to whom all there looked up. He thought more deeply and did more than all the rest. When, however, his indomitable energy was most wanted, he lay in bed grievously sick, prostrated by rheumatism, from the 16th November to the 20th December, at which time he was allowed up on crutches. During that month he could neither read nor write, but still endeavored to direct, and yet, after the war, he was the officer most blamed by the public for all our misfortunes, for his gallant chief had gone before a tribunal where his courageous and unselfish nature will assuredly be rewarded.

The sailors were amply provided for in every respect during the epidemic, but they suffered even more acutely perhaps from cholera by being crowded so closely together. One man would scream out in pain on the lower-deck at night, and his cries were generally followed by those of others. Thus the flagship lost one hundred and nine in a few days, and on board some of the French ships the mortality was even greater. During the second week of August, Admiral Bruat, when leaving our ship after five o'clock tea, said he was thankful he had not had a case. Next morning he sent to tell our captain he had one hundred and forty cases, of which forty were dead. His ship lost nearly one hundred men in

twenty-four hours. Those who survived an attack were so enfeebled as to be unfit for hard work; officers had to hoist out our admiral's barge, and for many days after we returned to Baljic Bay I was employed at sunrise and sunset, in carrying the dead of other ships out to sea for burial.

Similar debilitating effects were noticed in the army, and the infantry were unable to carry their knapsacks even for the two short marches of only six miles each back to Varna. So deadly was the climate of the singularly beautiful district in which our men had lived for a few weeks, that three thousand Guards, the pick of England's manhood, had six hundred men on the sick list.

When the admiral returned to Baljic Bay, taking in the most sickly ships for their crews to be landed for change of air, our captain, acting as commodore, signalled H.M.S. Diamond to carry in our letters for the English mail, and her captain, William Peel, came on board for orders. All our officers were anxious to see one who had already a service reputation as not only our youngest post-captain, but as one of the best. William Peel, the third son of the great minister who died from a fall on Constitution Hill, was then thirty years of age. He had been promoted, having seen service on the Syrian coast and in the China War, to be lieutenant in 1844, immediately on passing the six years' examination with such brilliant success as to elicit a public eulogium from Sir Thomas Hastings, who commanded H.M.S. Excellent, gunnery ship, in which Peel was then serving; two years later he became a commander. We had heard of him that when in command of his first ship he was reading in the stern cabin, and hearing the shout, "Man overboard," rushed to the window in time to see a blue-jacket pass underneath him. With one spring Peel was in the water, and supported the man till both were picked up; and when the officer of the watch ran down to report, "Man overboard — boat lowered," the cabin being empty, it was not known what had happened until both were brought on board.

In August, 1854, I had no idea I was to spend months with this man of highly strung nervous temperament, whom I learned daily to love and esteem more and more as "the bravest of the brave," till we were both wounded and invalided to England; I was evidently much impressed, however, for I recorded, "Captain Peel — very intelligent, sharp as a needle, never saw a more perfect gentleman." His looks and bearing were greatly in his favor, for he had a singularly striking appearance, showing both in face and figure what is termed, in describing well-bred horses, as "quality." His height was above medium, head gracefully set on broad, well-turned shoulders, light in lower body, with dignified yet easy deportment. His dark and curling hair was parted on the right side and carefully brushed back, disclosing a perfectly oval face, a high, square forehead, and deep, blue-grey eyes, which flashed when he was talking eagerly, as he often did. He had a somewhat austere face, smooth and chiselled in outline, with a firm, set mouth, which was the more noticeable from his being clean-shaved. Such was the man, quick in movement and brave in spirit, as shown in the first bombardment when he lifted a live shell —

> And as it burned,
> From the rent breach the fiery death returned.

During the epidemic H.M.S. Queen's ship's company had some sickness, mainly cases of intestinal complaints, but lost two men only from cholera, and H.M.S. London lost less than a dozen; but from their men being more effective in September, they did more work, and both ships suffered severely from an outbreak of rheumatic fever, from which the rest of the fleet escaped.

When the cholera was at its height, the fleet, then at sea, was shifting topsails, when a black cloud passed over a vessel in the weather and in the lee line. In each ship several blue-jackets

aloft, and marines on deck were struck down. This may have occurred from the cloud carrying germs, for it passed from Bulgaria to the Crimea, where the Russians lost four thousand men, or it may be that the men were already suffering from diarrhœa, and exertion made them worse.

There have been many striking descriptions of the allied fleets as they moved across the Black Sea, some six hundred vessels defended by three thousand cannon, but none have adequately portrayed the beauty and grandeur of the sight. It is of interest to remember that although the first soldiers embarked on the 29th August — the British transports assembling on the 4th September in Baljic Bay left on the 7th September — and arrived at Eupatoria, distant from Baljic two hundred and forty miles, only on the afternoon of the 13th, having enjoyed perfect calm weather. The rate of speed, four and one-half knots an hour, was too slow for convenience, but it probably could not have been put at more than six and one-half or seven knots, even if our allies had been able to tow their sailing vessels. Though their men-of-war were crowded with troops to an extent which would have proved serious if the Russians had ventured out with their fifteen ships of the line to offer us battle, yet the bulk of their army, being conveyed in sailing vessels, reached the point of assembly only on the 12th and 13th September.

From 6 A.M. on the 14th, when our boats left the ship, we were hard at work, landing troops and stores till 11.30 P.M., in spite of a heavy ground swell which, rising as the sun sank, broke up some rafts. The boats, after some preliminary work, assembled round the ships they were to clear, and so eagerly did the blue-jackets work that in one hour after leaving the ship, the seven battalions composing the Light Division were on shore, and by 3 P.M. fourteen thousand infantry and two batteries were safely landed. The French put six thousand infantry on shore in twenty-two minutes.

The solicitude of the blue-jackets for the safety of their red-coated comrades was remarked by many who saw the seamen spring into the water to ensure, as far as possible, their passengers landing with dry clothes. Sailors are taught to be careful of their human freight, and just then the fate of some thirty or forty Zouaves had been impressed on us. These men embarking at Varna, were in heavy marching order, when the pontoon in which they sat capsized, and all sank to the bottom. On the 14th September, 1854, to the best of my recollection, not a soldier of the twenty thousand we landed got a scratch.

While the armies were landing, H.M. ships Vesuvius and Sampson, pitched shells into a camp on the Bulganak, and caused the Russians to move it inland.

The first night in the Crimea was one of discomfort for our troops, and the steady downpour of rain, beginning in the evening and lasting all night, culminated in torrents at daybreak on the 15th, added materially to the sick list.

Lord Raglan to whom the choice of the actual spot was due, when the Katcha mouth selected by Sir George Brown was deemed too hazardous, pitched on an ideal tactical spot. A low strip of shingly beach, with a background of two hundred yards, was protected by a lake nearly a mile long and half a mile broad. The fields inland were covered by lavender and other pleasant smelling shrubs, but there was scarcely a tree or house to afford our men any shelter from the rain.

The cholera followed us across the Euxine. The army buried one hundred and fifty at sea and left three hundred sufferers on board. Nevertheless the health of the men had improved materially in a fortnight with ample food, good accommodation, and fresh air.

The officers landed in full dress, sword, revolver, with greatcoat rolled in horseshoe over the shoulder,

wooden water-bottle, some spirits, three days' cooked salt pork, and three days' biscuit. The rank and file, still weak from intestinal complaints, were thought to be incapable of carrying their knapsacks, but each man carried fifty rounds of ammunition, three days' rations, a greatcoat, and blanket containing in most cases a pair of boots, socks, and, by request of the men, a forage-cap. So irksome was some of our handsome headdress gear as to cause the men to discard it on the first opportunity. Indeed, I saw later in the campaign, men throwing away their headdress as they passed the head of Balaklava Harbor, on disembarkation.

The 15th, 16th, and 17th September were occupied in landing cavalry, artillery, and stores, the sailors being in the boats for twelve successive hours, with one hour's rest for dinner.

The discomfort, wetting, and consequent recurrence of cholera induced an order for tents to be landed on the 15th, but the only transport available consisted of three hundred and fifty country wagons,[1] rickety-looking vehicles prone to break down, and at their best equal only to a load of from half to three-quarters of a ton. The arabas had been seized or hired from the Tartars, but being required for other purposes, the tents were re-shipped on the 19th, when the allied armies advanced, the English numbering twenty-six thousand infantry, eleven hundred cavalry, and sixty guns; the French and Turks numbering thirty-five thousand infantry, and sixty-eight guns.

All our troops got their tents back early in October, when, with the exception of two cold nights, the weather was still pleasantly warm, but were less fortunate as regards their knapsacks and squadbags. These latter, left at Scutari, and containing generally a shell-jacket, shirt, and pair of socks, were received by five battalions at the end of December; by other battalions in March, and by some not until April. If any one had thought of it, an officer per battalion and a private per company left in charge of the knapsacks could have collected them on board one or more ships; and they could have easily been landed at Balaklava when the troops got there on the 26th September. In those days, however, we all thought the army would take Sevastopol and re-embark within a week or ten days. Even if the packs contained but little, that little and a receptacle to hold articles in the tents while the men were away in the trenches, would have been invaluable. When the packs were returned to battalions, about two months later, many had been rifled of their contents.

We embarked on and before the 19th September fifteen hundred men too sick to march. There was much suffering entailed on these unfortunate soldiers, many of them stricken by cholera, for after they were on board the ship detailed, the engines of the ship broke down as she started for Constantinople, and all the patients had to be transferred to other vessels. We now felt the inconvenience of our regimental medical arrangements, which, if expensive, and unsuitable for the attainment of professional skill by the doctors, were at least convenient in some respects during peace, giving two doctors to every battalion, who became acquainted with all those who came often into hospital. This system, however, was bound to break down in war, and thus prove as disastrous for the men as it was prejudicial to the medical officers, who had neither adequate opportunity of utilizing their technical knowledge, nor of practising the administration of their department. The regimental doctor and his assistant, were naturally as anxious to remain in the field, as the commanding officer was to retain their services, for any day might bring forth a bloody fight requiring every available skilled surgeon; and so they marched on with six or seven hundred fairly healthy men, while the sick were sent back with insufficient medical attendance. All of us who have moved a family for an autumn trip, even with ample prep-

[1] Arabas.

aration, can realize how often arrangements break down, especially when they are hurriedly made. Now the company officers had been ordered to land with such articles only as they could carry, and naturally few burdened themselves with stationery. The names of the sick who were able to talk were doubtless entered in lists on board ship, but there were many too ill to speak.

The officer commanding a battalion, writing on Christmas day, 1854, lamented he had forty-seven men missing for whom he could not account, and assumed they fell out on the march round Sevastopol. Later, a statement by the captain of a transport explains how many such cases may have occurred. During one trip between the Crimea and the Bosphorus, he buried seventy men at sea without being able to record their names, or even that of their regiments.

This was only the beginning of our sufferings, arising mainly from inadequate preparation; before the end of January thirteen thousand men left for the Bosphorus, of whom nine hundred and seventy-six died during the passage of thirty-six hours; and after the sick were landed at Scutari, five hundred and twenty were buried in the cemetery, for whom it was impossible to account. It is consoling to reflect that all this misery was not in vain; and in recent expeditions, for instance, in that up the Nile, our front base hospital at Wady Halfa, seven hundred miles above Cairo, was supplied with ice for severe cases, and hospital-ships, with ample medical and record staffs, alleviated the sufferings of our soldiers abroad, and the mental anguish of their families at home.

It was fortunate the fleet was within an easy walk of our troops, for there was scarcely any land transport for the sick, many of the ambulances having tumbled to pieces in Bulgaria.

As the army could not transport its sick and wounded, it is to be regretted it did not move forward at daylight on the 21st September. Every military text-book enjoins the close pursuit of a beaten enemy, and there was no reason for losing forty-eight hours in carrying down wounded and burying dead, both of which might have easily been done by the sailors of one or two ships, if left behind for the purpose. Before the action was over, the admiral signalled "Hold surgeons ready to send on shore," and many of the wounded were carried down by our sailors, but we might have relieved the soldiers of all such dispiriting work, which it is inadvisable to impose on even the bravest troops, who may be required to fight again in a few days.

Although we all watched the battle of Alma from our ships, which moved parallel with the armies to the mouth of the river, few of us realized the importance of the struggle — I certainly did not until I landed. This misconception was partly attributable to the easy success of the French, who were nearest to us, and who met with but little resistance, as is evident by the respective losses on equal numbers engaged.

FRENCH.

Killed — Officers, 3.
Total reported loss, 1,340 of all ranks.[1]

ENGLISH.

Killed — Officers, 25; sergeants, 19; rank and file, 318.
Wounded — Officers, 81; sergeants, 102; rank and file 1,438.
Missing — 19 (supposed to be buried in Bourliouk).[2]
Total — 2,002.

General Sir E. Hamley, following Kinglake, puts the French loss in killed at sixty. This must be, I think, an underestimate, as I recorded in the evening after the battle, having noticed in a hurried walk the various wounds on the bodies of nineteen Frenchmen laid out in a row for burial.

When I visited the field of battle in August, 1894, there was little change observable except that, in rebuilding the burnt-down village of Bourliouk, the tendency has been to spread the houses further westward.

[1] This included all losses from cholera and other diseases, from embarkation till the 22nd.

[2] It is more than probable these men died of cholera during the march or on board ship.

Hamley's account of the battle is concise and clear, but I think neither he nor any other writer I know, has shown adequately the difficulties of passing through the valley where the Light Division and Guards crossed, especially to troops trained to "march like a wall, and wheel like the swing of a gate." This year there was scarcely any water in the river, but near the farm used by the doctors as a dressing station there are two river beds, one being nine feet deep, and a deep ditch. There is rather more arable and less land under grass than forty years ago, and more trees are growing in the valley, but nothing can so change the look of the place as to cause any difficulty to a visitor who can read a map. The fruit trees and vines were laden, and around Captain Cust's grave were tomatoes, apples, pears, and peaches in profusion.

The field is most easily reached by crossing Sevastopol Harbor in a boat, and carriages having been sent round (eighteen miles) overnight; Bourliouk from the north of the harbor is a drive of two and a half hours.

September 23rd, 1854.—Every one is talking of the gallant bearing of Sir George Brown, and the manner in which he rode on in front of the Light Division. We have re-embarked his horse, wounded in seven places, but hope to save its life.

Thus I wrote at the time, expressing the general opinion of the army. Sir George had served with distinction in the Peninsula, been wounded at Bladensburg, and both from his training, including that of adjutant-general to the forces, and from the bent of his mind, was strongly opposed to changes in our army system. Officers told with glee that, when the men were excused wearing stocks on the queen's birthday parade in Bulgaria, this innovation was strongly opposed by the leader of the Light Division.

It was generally believed, in the spring of 1855, he tried to reintroduce the stock. In an interesting letter now before me, written in 1859, he expresses much apprehension that we were neglecting discipline for the sake of musketry. Nevertheless, and in spite of a somewhat curt manner and decided views expressed in emphatic language, he was greatly esteemed by those under his command.

The men of the Light Division always spoke of him as "the general," as was then, and is still, though in a lesser degree, the habit of soldiers, possibly from not knowing the name of the immediate leader. This ignorance cost Sir George £1 during the worst of the winter. He had seized an opportunity of meeting Lord Raglan to urge the desirability of his showing himself more frequently in the camps.

"What good will it do?"

"Oh! 'twill cheer the men up. Why, sir, numbers of my men don't know your name."

"But they don't know your name, George!"

"Every man in the Light Division knows *my* name."

"I'll bet you £1 the first man we ask does not."

"Done," said Sir George; and they rode to the Light Division camp.

"Come here, my man. Who am I?"

The soldier halted at three paces, straight as a ramrod.

"You're the general, sir!"

"But my name?"

"You're the general, sir;" and nothing more could be elicited from him. Sir George Brown paid up on the spot.

No one who saw him ride straight towards the foe, without an indication that he was in any danger, is likely to forget the animating effect of his bearing on the soldiers.

From the 25th September, when we lost sight of the armies as they marched inland, we were in suspense for a week as to the assault on the town. Would it be delivered at once? Should we be allowed to have a turn at the sea-forts? Or, would the attack be delayed till the siege-train was brought up? On Sunday, 1st October, however, the admiral signalled from Bal-

aklava, "Line-of-battle ships, send one hundred and forty men and proportion of officers for service with land-forces." While the captain was discussing the detail of the detachment I was sent on board the acting commodore's ship to ask in what uniform the officers were to land. The reply was too free to be recorded as given, but was to the effect, "He didn't care a *blessing* if they painted themselves black, and went naked." Returning on board, I delivered the answer in modified terms. The discussion was still going on as to the landing party. All had been nominated except a midshipman. Captain Burnett, who was going in command, had been told to choose those whom he preferred. It so happened that several of the senior midshipmen had fallen under his displeasure, and, trembling with eagerness, I watched his eye as he looked us over, but I had only just passed my two-year examination and it went by without resting on me. The captain was my mother's brother, and though personally kind in his manner, we all thought he was harder on me than on the other youngsters. I had joined H.M.S. Queen early in 1852, when he had been fourteen years on shore, and was without prospect of employment. Our captain was so terribly hard on the men that they declined to go to sea again under his command, and the ship was paid off in July to get rid of him, and re-commissioned the same day by my uncle. I disliked the idea of sailing with a relative, and twice applied to leave the ship; once to serve with a friend, W. N. W. Hewett, mate of H.M.S. Spartan, and once to go to the Cape in H.M.S. Melampus, but was curtly refused. Before we left the Channel in 1853, I had been taken into favor for handling a boat in good style when bringing off the captain's grandson (now Mr. Farwell, Q.C.), during a gale of wind, to the ship then lying in Plymouth Sound; and I had again been commended for boat service in the Bosphorus when I was away from the ship four days. These episodes and family pride (for he had been decorated for distinguished conduct in "cutting out" a vessel under close fire at Algiers in 1816) gave me my first chance of active service. The captain said, "Which midshipman?" "I am thinking, sir!" "Take young Wood." "Oh! he's too young, sir. It will kill him!" "No, Burnett, I'll answer for him;" and as the commander said, "Well, youngster, you shall come," I felt I could never sufficiently repay my uncle. The other officers were, Lieutenant Partridge, gunnery instructor, Lieutenant Douglas, who generally assisted him, and Mr. Sanctuary, a mate. Captain Burnett often said and wrote he hoped he might not be buried in the Crimea, but in the ocean he loved so well. He attained this wish, for he escaped wounds and sickness till he left the brigade on promotion, dying years later with fortitude, with nearly all his crew, in the wreck of his ship, H.M.S. Orpheus, on the Manakou reef, New Zealand. Partridge was invalided during the winter, Douglas, "brave, tender, and true," as befitted one bearing the name, was killed, and Sanctuary invalided, being severely wounded the day we opened fire. All the vacancies throughout the brigade were filled up as they occurred, and, at the end of nine months, I was the only one left of those who landed early on the 2nd October.

We slept in Balaklava on the 1st October, and at 4.30 next morning began rigging up shears to land our guns. This was accomplished by sunset, and we got tents and blankets on shore, pitching to the west of the head of the harbor, opposite the hamlet of Kadikoi. Close to our camp were vineyards, bearing great quantities of delicious fruit. Cholera had frightened us a little, and orders had been issued forbidding soldiers to enter them; but I saw one cavalry regiment (which probably had never received the order, as it landed later on the Katcha) ride on its return from watering the horses, through the vines, from which the men carried off great branches without even dismounting.

Next morning we were up at 3.30,

when Captain Burnett made me swallow, most unwillingly, a dose of quinine, which, half an hour later, to ensure its being taken, was administered to every man on parade. Sanctuary then took me off to a small ditch, in which we stood stripped, I shivering in great discomfort. We were told the army could not assist us with transport, but that it was most important to open fire on Sevastopol at once, and for the next six days our life was spent in dragging guns and ammunition up the Balaklava col or hill; on the 4th October the brigade was divided, one half working from the harbor to the col, and the other from thence to the Light Division camp. The 68-pounder guns were dragged up on travelling-carriages lent to us by the artillery, but they could not lend us enough for the other pieces, and nearly all the guns were dragged up the hill, and later down into battery on their ships' trucks.[1] We put fifty men on to three drag ropes, placed a fiddler or fifer on the gun, and if neither was available, a tenor was mounted to give the solo of a chorus song, and thus we *walked* them up.

Probably no twelve hundred men ever worked harder. We breakfasted daily at 5, began work at 5.30, and, except for one hour at midday, worked till 6 P.M., doing the work of horses, the distance by the track from Balaklava to what was about to become the right attack being just eight miles.

Mr. Kinglake, the historian, aptly termed the sloping fissured plateau on which we were to live, fight, and suffer, for so many weary months, the upland. Its eastern side stands five hundred feet above the Tchernaya valley, and the plateau extends in a straight line from north to south, reckoning from the head of Sevastopol Harbor to that at Balaklava, eight miles, and eight miles from east to west, measuring from the height overlooking Tractir bridge on the Tchernaya River, to Kamiesh Bay, which the French made their base of supplies. For practical purposes the extent of ground over which the British army worked may be taken as seven miles by four, as the crow flies. The plateau was bounded by a wall of cliff-like formation, which runs generally from north to south from the head of Sevastopol Harbor for six miles, when it trends south-west, and passing a mile to the northward of Balaklava, joins the cliffs on the seacoast. The surface of the upland is channelled by many ravines; those which had most influence on our operations commence generally close to the eastern wall-like boundary, and running from south-east to north-west, divided the fighting position of the allies into several different parts. The Woronzow Road ravine is steep and impassable for armed men; the Careenage ravine is, at the northern end, for a long distance precipitous, and in all parts the cliffs overhang the valley.

We tried to be too sharp at first, and the French courteously giving way, had much the easiest line on which to excavate trenches of attack, to defend them, and for haulage, from the base. When the armies left Kalamita Bay, the French having no cavalry took the right, which was covered by the fleets. The English army took possession of Balaklava after a mock resistance, twenty-four hours before the French came up, and we ought to have moved on to the north-west; but our ships were in Balaklava, and our admiral insisted its retention was essential for the British navy. The French then adopted Kamiesh, where they got more room for shipping and a gradual rise over undulating country for their vehicles, instead of the sharp ascent from Balaklava, which caused us great trouble when the weather broke.

The tactical disadvantages of our position were, moreover, much greater than those encountered by the French; their left flank rested on the sea; we covered their right flank, and in spite of stretching our line till it nearly snapped, and must have done so but for the fine fighting value of our officers and men, we were obliged to leave

[1] Wheels.

unguarded on our right a great extent of ground. With more men we should have occupied the so-called Inkerman ridges down to, and including, the Mamelon in the first instance, and our failure to do so was one of the main causes of much subsequent loss.

I must go fully into the question of our siege works and batteries, for it was in them our soldiers died from starvation, want of clothing, and overwork; and it was in them we wore down the Russians till they withdrew across the harbor, Alma, Inkerman, and Balaklava being but incidents in the war, albeit of a glorious kind.

When our armies first got into position to east, south, and south-west of Sevastopol, we opened trenches about eighteen hundred yards from the enemy's works as they appeared in the last week of September. They stood generally on ridges opposite to those of the allies, and on dominating points of these ridges were placed the Malakoff, three hundred and thirty feet above the sea; Redan, three hundred and six; Flagstaff Battery, two hundred and eighty; and Central Bastion, two hundred and forty-seven feet. The choice of our positions for attacking the city was limited; firstly, from the impossibility of going in to the usual breaching distance, unless we embraced the Inkerman, and Thistle later called Victoria, ridges down to the Mamelon, for works erected on the Mamelon by the Russians would have taken our batteries in reverse, as later in the siege happened; and, secondly, because at about eighteen hundred yards from the Russian works, the hills on which we dug, sloping down from the crest covering our camps with a gentle fall for twenty-five hundred yards, fell with so steep a gradient that, had we gone four hundred yards further, the enemy would have looked down into our trenches.

The main, though not the deepest, fissure of the ravines which I mentioned as dividing up the plateau, separated the English and French attacks, and on the English side there were four ridges sloping down from south-east to north-west, all separated by deep ravines with steep sides, the two inner of which ran through the Russian works, while the Careenage ravine cutting off the Inkerman ridge terminated in the great harbor; and the ravine, which passed to the westward of the English attack, joined the largest ravine, which was the point of junction between the armies, and ended at the head of the Dockyard Creek.

On the 8th October the naval brigade was established within seven hundred yards of the picquet house, which, being on the crest, looks down to the city. We were close to the Light Division, but separated from it by the Woronzo Road; the 2nd Division was one and one-half miles further north, with the 1st Division in its left rear; and the 3rd and 4th Divisions were from a mile to one and one-half miles to the south-west of the naval brigade, the cavalry and horse-artillery being in the Balaklava plain. Two French divisions encamped on and guarded the east and south-east side of the upland, while two opened approaches against the enemy between the English position and the sea.

From the 9th to the 16th October inclusive, the sailors assisted in the erection of the batteries, in addition to dragging down all their ammunition, amounting to five hundred rounds per gun. We turned out daily at 4.30 A.M., and with half an hour for breakfast and an hour's rest for dinner, all worked till 7.30 P.M., except the night parties, which rested from 2 P.M. to 8 P.M., when they worked till daylight.

One night during this week, on an alarm being given that the Russians were advancing, the officer in command gave the word "Retire" to the unarmed working parties, but it was understood to apply to all, and the movement was carried out so hastily that many men left on the ground their blankets and wooden canteens, which contained rum and water. It was a false alarm, and the soldiers returned to find, helpless on the ground, some sailors who had drunk too much rum and water!

The spade work of the soldiers varied considerably, but from the Royal Engineers' journal of work done in Bulgaria, and from what I saw earlier in the siege, that of the Guards' Brigade was undoubtedly amongst the best. This may have arisen from the memory of instruction at Chobham camp in 1853, or from regimental pride, or from both causes. Our infantry knew very little of siege-work duties, and it became necessary at a time when every sapper was required at Varna to prepare siege materials, to take off nearly half of the small force available, to instruct the line in throwing up trenches, and other siege duties. By the end of August the infantry had made six thousand gabions[1] and eight hundred fascines.[2] For every one of these passed as serviceable the soldiers received 14*d.* and 7*d.* respectively, which included the labor of cutting and carrying the brushwood which was close at hand. In the Guards each section of three men produced three gabions daily. In the line the average did not exceed one gabion daily per section. Throughout the long ensuing siege the working parties in the trenches did well or badly in proportion to the efficiency of the officers. When they sat and smoked, paying no attention to the men, the sergeants followed suit, and but little progress was made. On the other hand, when the officers, keen and sympathetic, knew how to get cheerful work out of their men, the spirits of the directing engineer officer rose considerably.

On the 16th October bets were freely offered in our camp that the city would fall in twenty-four hours. Some of the older and more prudent officers gave the Russians forty-eight hours, but no one thought they could withstand our fire longer. My older messmates would not allow me to buy a good Paris-made gold watch which a soldier had taken at the Alma and offered to sell for £1, saying, "In forty-eight hours gold watches will be much cheaper!" When orders were issued on the afternoon of the 16th October, detailing Lieutenant Partridge and Mr. Sanctuary, for the first relief of the Queens, Lieutenant Douglas and Mr. Wood for the second relief at 10 A.M., Douglas swore and I cried from vexation, so persuaded were all of us that the Russians would offer but little resistance after four hours' bombardment. Yet on the 24th August, 1894, seeing the guardian of the Malakoff with three decorations, I asked him in what corps he had served. "As a sailor in the batteries." I observed, "Well! As a sailor from that battery opposite I fired at this place and the Redan for nearly nine months." He replied, "I fired at you from the Redan for eleven months." Certainly we were over-confident.

When I left my former adversary, after looking at the spots where Admirals Korniloff and Nakimoff were killed, I rode round the embanked northern end of the Karabeluaia ravine, and up to the right flank of the 21-gun battery. The parapets are now scarcely visible at first, except to one who knows where to look, and I had never before passed from the ravine up to our position on Frenchman's Hill. It is, however, striking in itself, and I suppose nine months' work on it, even though forty years ago, fixed it firmly in my mind, for I rode absolutely straight to where the right Lancaster gun stood, which was where Lord Wolseley wished to commence our round of the trenches. In the 21-gun battery — or, rather, in the approach to it from the Woronzow Road — Lord Wolseley showed me the place where, late in the summer of 1855, he witnessed a curious fatality. Two men were counting over picks and shovels while he was verifying the numbers — all three were close together — when a round-shot decapitated one man, driving his skull into the face of another sapper, who was thereby severely wounded. Any one who served in the trenches can easily recognize them — the rocky nature of the ground has prevented any attempts at cultivation, and

[1] A hollow cylindrical basket, used in building up earthen walls.

[2] *I.e.*, long, thin faggots.

its marked features are so distinct as to prevent mistakes.

At 2.30 A.M. on the 17th the officers all turned out to get the first relief off, looking to their salt pork and biscuits, and feeling every water-bottle to ensure its being filled up. No one could lie still after 6.30, when fire was opened, and at 9 Lieutenant Douglas took my pony and cantered up to the Picket House, rather less than half a mile, whence he could see the artillery duel, promising I should be allowed a look on his return. This pony, although it had cost me but fifteen shillings, had already been very useful, for when we were encamped near Balaklava, at meal hours my messmates rested, but I never got five minutes' repose, being constantly employed carrying messages. The pony was stolen shortly afterwards, but I replaced it in November from a drove brought by a speculator from Asia Minor.

Half an hour after Douglas had gone, a blue-jacket ran into camp from the battery announcing many casualties, and bearing an order from Captain Peel for every available man to come down with powder. I at once loaded up four carts, with the Queen's reliefs, and hurried off down the Woronzow Road ravine, lest my senior should return and order me to remain in camp. When we got about five hundred yards from the 21-gun battery, several round-shot and shell fired from the Redan, distant two thousand yards, passed over our heads, making, I suspect, some of us less eager for the fray, than we were when in camp. Presently a shell burst immediately over the leading cart, and a fragment carried away one of the wheel spokes. The man in the shafts, and every one at the drag-ropes, ran before my slower perceptions were acted on, and I was thus enabled to make a good start by peremptorily recalling them to a sense of our duty. They returned with a higher opinion of their officer than he merited, as I saw clearly, before the idea of running occurred to me, that the danger was over. We got the powder up the northern cliff of the road into the caves, which had been converted into magazines, and I passed up the left covered way into the battery, where the smoke was so dense as to shut out all objects more than a few yards distant. Leaving my men under cover, I went along to report my arrival, and was just behind guns manned by the Diamonds when a shot, passing very near my head, made me bend down, and I felt my foot press on something soft. It was the stomach of a dead sailor, with nothing but trousers on the body, and stepping hastily forward I landed on another dead man — the captain of the main-top! The shock to my feelings made me carry my head fairly erect for the next eight months.

Before continuing my narrative of Captain Peel and his sailors I will state generally the result of the first bombardment. It was deemed so certain that the one hundred and twenty-six guns which opened at 6.30 A.M. would crush the Russian fire, that preparations had been made for an assault that evening. The troops off duty stood ready to "fall in" without coats or blankets — assaulting columns were detailed with engineer officers as guides, and sappers with scaling ladders, and the horses of the field batteries stood "hooked in."

During the forenoon, however, the French gunners were fairly beaten — two large magazines blew up, causing great loss of life, and at 1 P.M. the French batteries ceased firing, just as the allied fleets came into action. We cheered as they engaged the forts, but at sunset had the mortification of seeing them withdraw. They had suffered more than the forts. The English batteries had only eight guns dismounted, and re-opened fire soon after daybreak next day.

The British Left attack ran short of powder in the afternoon, and had moreover, the undivided attentions of such Russian batteries in the vicinity as could train their guns on it after the French ceased fire; and, to the best of my recollection, the 21-gun battery was the only one that fired unceasingly till

the 20th October inclusive. This was certainly due to our master spirit, Peel, not only by his providing the ammunition, but by the vigor he instilled into all his subordinates. The naval officers put their hearts thoroughly into their work. I have written they sent into battery their servants, and throughout the siege able-seaman Elsworthy was the only man taken off duty to draw rations, cook, and mend the clothes (brushed they never were !) of a commander,[1] four lieutenants, one mate, and a midshipman.

Every regimental officer believed that we could carry the Malakoff and Redan that evening, and this was not unreasonable, for they had all the confidence accruing from their recent success at the Alma. Although their men's bodily strength was not equal to a long march, it was sufficient for a dash at the enemy's position. The army averaged about seven years' service, the men being from twenty-five to twenty-seven years of age ; they had been drilled to rigidly obey orders, and would probably have retained their formation under losses, in a manner which the boy soldiers of a few months' service, who were sent against the Redan nine months later, could not be expected to emulate. Moreover, these boy soldiers had all their short service in the worst of schools, that of the trenches, where they were continually taught to keep under cover, a habit which is detrimental to a successful assault.

Our chiefs probably thought that we could carry the works opposite to us, but in combined operations concession is essential. We had the advantage later of the large numbers that our allies could bring into the field to our assistance, but there are many disadvantages that belong to joint operation ; and although the best spirit prevailed between our commanders, these disadvantages were felt so seriously by General Pelissier towards the end of the war as to induce him to recommend, in the event of its being continued after the fall of the town, that the armies should work in different zones.

On the afternoon of the 17th October, the French expecting to re-open on the 18th, asked for twenty-four hours' delay, which Lord Raglan could not refuse. A further delay till the morning of the 19th became necessary, when the French re-opened fire, but the Russians had then repaired their damages, and were in better condition than on the 17th October ; and by the 20th the English batteries had lost the undoubted mastery they obtained on the first day.

On the 19th or 20th October, three officers were passing straight from the Woronzow Road to the right of the 21-gun battery, while the "Twelve Apostles" was pitching shot up towards us from a very long distance ; several rolling near us like cricket balls, and one of my comrades jumped to avoid a shot which seemed to be about to stop. It rose, however, on a stone and carried off both his feet.

In the first few days Captain Burnett and Lieutenant Douglas were checking the aim of a gun before it was fired. It was not till later we realized that of two guns which appeared to us to be in the same alignment, one was nearer to us by many yards than the other standing next to it, and required less elevation, the error of "shorts" and "overs" being apparently due to bad *laying*. While the aim was being discussed, and as the two officers and eight men stood around, a mortar shell fell immediately under the gun close to the front of the carriage and exploded. The effect was remarkable. The gun was cut into two parts, the charge exploded, our cannon shot went into the air, and the carriage and breech of the gun turned a somersault backwards, yet not a man was scratched.

We were very proud of ourselves when we first opened fire, and had adorned our battery with a board on which was printed, "The Koh-i-nor Battery." This and a Union Jack hoisted behind the centre gun was soon knocked over — the name we abandoned, but the flag-staff was replaced

[1] Lieutenant Douglas, R.M.A., brother to my friend, joined us a short time later.

again and again. Captain Peel, whose idea it was, fixed it up twice the first day, but eventually nothing remained of the pole, and we fastened it to a spare rammer, stuck into a pyramid of gun-trucks.[1] On one occasion, while I was putting the finishing touches to what I fondly imagined would give a firm hold, a shot striking the pile, cut it down to the ground.

When I got back to camp that evening I had to fetch water, and then dig up roots for fuel to make our tea, for in our enthusiasm we had abjured, as I have stated, the use of servants, and sent every seaman into the battery. Perhaps our ardor cooled; perhaps my cooking was not approved; but to my great relief W. Elsworthy resumed his duties next day.

Elsworthy was one of that uncommon class of sailors or soldiers who, while perfectly respectful to the commanding officer, never hesitate on occasion to contradict him flatly, and I became greatly attached to him for his care of us, and his determination to stand by me. He accompanied me on most of my foraging expeditions, but in December I had gone alone to Kamiesh, and purchased half a large pig for £2 18*s.*; possibly I gave too much, but I had difficulty in bringing it home seven miles on the pony, and was much mortified at dinner on being told by the commander I had done very badly. Elsworthy, who was not only our cook but butler, interposed and gravely asserted the commander knew nothing about the prices of pork, and that my purchase could not be surpassed.

On the 17th October, I was employed till the afternoon carrying powder from the caves into the battery, passing every turn two companies, acting as covering party to the guns, lying on the southern slope of the hill on which the guns were firing northwards. They were under a square heap of stones, but the spot was badly selected, being where the over-shots of the Malakoff and Redan crossed; one sergeant as I passed close to him, was cut into two pieces by a round-shot which struck him between the shoulders, the dull thud of the blow making me look up.

I was glad to get to work in the battery, which was less trying to the nerves and much more interesting. When arguing with Mr. Sanctuary, whom I was relieving of his charge of three 32-pounder guns, as to the best elevation for the Malakoff, he offered to lay a gun for me, and while we were checking the aim along the sights a shell burst on the parapet five feet in front of our faces, and stones hitting Sanctuary in the face knocked him senseless on to me. When we got him round, by help of some very dirty water, he bravely declined all aid, and tried to walk back to camp, but the sight of one eye was gone, the other injured, and, probably from concussion, he could only walk in a circle, so I forced him to accept a man's arm.

We were all fond of Sanctuary, and as sorry as one could be such busy moments. We had nearly lost him some months previously when reefing topsails in a fresh breeze. He was lying out on the fore-topsail yard, when the jib stay carrying away struck him on the head and knocked him senseless off the yard. There was a cry, "man overboard," and several men rushed eagerly to the side, but his body was neither in the water nor on deck. Presently a fore-yard man shouted, "I've got him," and my friend, still insensible, was taken out of the belly of the foresail which, having been clewed up, was then in festoons.

Soon after Sanctuary had gone back to camp some artillery wagons came down with powder, and unloaded most of it near the stones where the covering party of infantry was lying. One wagon was brought right up to the battery, and as it could not get into the trench, it was halted in full sight of the Russians, until it was unloaded by Captain Peel and Lieutenant Douglas.

We had some difficulty about the powder-cases lying near the stones. They were out of sight of the enemy, but both shot and shell kept bounding

[1] *I.e.*, the wheels of a ship's gun carriage

about the boxes like a shower of skittle-balls. Captain Peel told me to take some men down and bring it all up, but after getting a case or two away, the men, without actually refusing, declared the work was too dangerous. I was then authorized to promise a sum of money to any blue-jacket who would come down first, but failed to get help till Commander Burnett, to whom I reported my difficulty, calling the nearest captain of a gun,[1] said, "Come on, Daniel Young, we'll go to the devil together, if at all." He and Young, a fine big man, shouldered a box and carried it up. This gave us a start, and several cases were brought under cover without more than one sailor being wounded. Mr. Daniells, of H.M.S. Diamond, aide-de-camp to Captain Peel, tried to carry one with me, slinging the box on a fascine, but the boxes held one hundred and twelve pounds of powder, had interior cases of thick zinc and solid wooden outer coverings, and the weight was too great, for the fascine bending let the case on my heels, and we could not manage the load; so we agreed to sit on it till the last box was gone. I did not know at the time that any soldiers helped, but am now satisfied that Sergeant-Major H. Burke, late 1st Volunteer Battalion Queen's West Surrey, did so, as he has written to me the exact expression used by Captain Peel, as to the bad selection of the spot for unloading the wagons.

Although the casualties were comparatively few, it was manifest that the choice of ground was unfortunate for unloading ammunition. I saw a mule approaching the spot, loaded with two barrels of powder, struck full in the chest by a shell; it exploded, scattering the carcase of the mule, but without igniting the powder. I saw also a curious escape. The drivers of a wagon we had emptied were in the act of mounting, and as the wheel driver was swinging his right leg over the horse's back, its hind-quarters were knocked away by a round-shot.

[1] "No. 1" in artillery language.

In the afternoon a load of powder blew up at this spot, throwing a horse many yards in the air; whereat the Russians, standing erect on their parapets, cheered — a compliment we returned about 3 P.M., when a magazine in the Malakoff, and two in the Redan, exploded in rapid succession, the latter with such terrible effect that three guns only returned our fire at sunset, while the Malakoff Tower was in ruins, and there were two guns only in action in the battery below it.

But though all our officers were brave, it was Captain Peel who inspired his followers with a part of his own nature. He exemplified the American poet's hero —

> The bravest are the tenderest,
> The loving are the daring.

This man, who never quailed, felt acutely every shot and shell which passed near him, but the only outward effect was to make him throw up his head and square his shoulders, yet his nervous system was so highly strung that even a flesh wound became dangerous in his case. In 1851, when crossing the Nubian Desert, from Korosko to Abu Hamed (where Colonel Stewart and his companions, sent down by Colonel Gordon, were treacherously slain in 1884), Peel dismounted from his camel to give water from his store to a small dying bird! To this tender-hearted man it appeared our blue-jackets should be encouraged to stand up to their guns like men, and he asked four of us, two Diamond's and two Queen's, to set the example in the battery by always walking erect, and without undue haste.

Next day he, to my knowledge, although I did not see it, gave us a grand example. A shell weighing forty-two pounds came through the parapet and rolled into the centre of a small group of men, who threw themselves flat on the ground, which would not, however, have saved those nearest for there were several boxes of powder on the ground, then being passed into the magazine. Peel, stooping down, lifted the shell, and resting it on his

chest, carried it back to the parapet, and stepping on to the banquette,[1] rolled the shell over the superior crest,[2] on which it immediately burst.

The following day I had been relieved, and was eating my ration — salt pork and biscuit — on one side of a gun, when a shell burst on top of a magazine on the other side of the gun. It created some trepidation, although the danger of the powder exploding was remote unless another shell fell on the roof. The officer excitedly shouted to the senior lieutenant: "Shell burst in the magazine, sir." Now Ridge, 1st Lieutenant H.M.S. Diamond, was as brave as he was efficient, and responded without concern: "Ay! ay! put it out!" but the shouts were repeated, and I was eventually obliged to abandon my dinner, to stamp out the burning bags and fill up the crater made by the explosion. While so engaged, I felt some one alongside helping me, but did not look up; for with shells striking the parapet on either side, the position was not one in which I was inclined to linger, and thus did not notice it was Captain Peel till the work was done, when he ordered me down. This was the beginning of a friendship which lasted till his death at Lucknow, in 1858.

In the spring of 1855, Captain Peel was walking with Captain Wolseley, assistant engineer,[3] one night, up and down in rear of the 21-gun battery, when a mortar shell fell on the projection built up to shield the entrance of a magazine. The shell burst immediately, and as the sandbags caught fire the magazine man came tumbling out like a harlequin in a pantomime. Before any one else moved, Peel was on the magazine pulling down the burning mass of bags, and was immediately joined by his companion.

On the 19th October, some Russian riflemen came up to the north end of the stone quarry, on the southern summit of which our battery stood, and from rocks four hundred yards distant, annoyed us greatly by their good practice through our embrasures, till a premature shell from their own people in the Malakoff dislodged them, and they ran back in spite of the fire of the "covering party" of soldiers. From one soldier I borrowed a rifle for the second captain of a gun, who knocked over a man, the remainder getting under shelter in the middle ravine, whence an officer and private came back for the man who had fallen. They did not carry him off, possibly because he was dead, but the fire of several men did not make the officer hurry away, and he removed his cap and bowed once or twice when stones near him were struck.

During the last day or two of this bombardment I saw a curious sight. A cart loaded with round-shot had, by a mistake, been brought during daylight up to the battery, and two men were in the cart throwing out the shot, when the cart was struck about the middle of the load, while one of the men was lifting a shot. Neither man was touched by the enemy's shot, but it impinging on the heap in the cart, scattered our shot high in the air and in many directions. One blue-jacket lost an arm and leg, the other an arm and some fingers of the other hand.

We all landed with as much kit only as we could carry, and my supply of pocket-handkerchiefs was limited to one in use — one at the wash, but this cost me nothing, as I expended both during the first bombardment. One was used to tie up able-seaman Simmonds, H.M.S. Diamond, who was dangerously wounded by a shell splinter in the thigh. Six months later he came to thank me for the gift. The use of the other was more germane to the intention of the manufacture. On the 20th October a shell burst immediately over a gun I was working, and struck down, among others, Edward Hallett, carpenter of the crew of the Queen. He was greatly knocked about, and as I helped a doctor to turn him on his back, for all his wounds were in front, we noticed his nose was nearly off, hanging by a bit of skin. The doc-

[1] Footstep of earth.
[2] Top slope.
[3] Now Field Marshal Viscount Wolseley.

tor wiped off some of the grit with my kerchief, and refixed the nose with it. The nose joined satisfactorily and Hallett was invalided with a pension for his other wounds, but died two years later.

From Chambers' Journal.

THE ROMANCE OF COTTON.

THE Father of History, in writing about India — "the last inhabited country towards the east" — where every species of birds and quadrupeds, horses excepted, are "much larger than in any other part of the world," and where they have also "a great abundance of gold," made the following remarkable statement. "They possess likewise," he said, "a kind of plant, which, instead of fruit, produces wool of a finer and better quality than that of the sheep, and of this the natives make their clothes." This was the vegetable wool of the ancients, which many learned authorities have identified with the byssus, in bandages of cloth made from which the old Egyptians wrapped their mummies. But did Egypt receive the cotton plant from India — or India from Egypt — and when? However that may be, there is good reason to believe that cotton is the basis of one of the oldest industries in the world, although we are accustomed to think of it as quite modern, and at any rate as practically unknown in Europe before the last century. As a matter of fact, nevertheless, cotton was being cultivated in the south of Europe in the thirteenth century, although whether the fibre was then used for the making of cloth is not so certain. Its chief use then seems to have been in the manufacture of paper.

The beginning of the Oriental fable of the vegetable lamb is lost in the dateless night of the centuries. When and how it originated, we know not; but the story of a plant-animal in western Asia descended through the ages, and passed from traveller to traveller, from historian to historian, until in our time the fable has received a practical verification. Many strange things were gravely recorded of this plant-animal: as, that it was a tree bearing seed-pods, which, bursting when ripe, disclosed within little lambs with soft white fleeces, which Scythians used for weaving into clothing. Or, that it was a real flesh-and-blood lamb, growing upon a short stem, flexible enough to allow the lamb to feed upon the surrounding grass.

There were many versions of the marvellous tale as it reached Europe; and Sir John Mandeville, as usual, improved upon it. He vouched for the flesh-and-blood lamb growing out of a plant, and declared that he had both seen and *eaten it* — whereby Sir John proved himself a somewhat greater romancer than usual. Nevertheless, he has a germ of truth amid his lies, for he relates of "Bucharia" that in the land are "trees that bear wool, as though it were of sheep, whereof men make clothes, and all things that are made of wool." And again, of Abyssinia, that mysterious kingdom of the renowned Prester John, he related: "In that country, and in many others beyond, and also in many on this side, men sow the seeds of cotton, and they sow it every year; and then it grows into small trees which bear cotton. And so do men every year, so that there is plenty of cotton at all times." Here, then, we have evidence that, eighteen centuries after Herodotus, cotton was still being cultivated, as the basis of a textile industry, both in western Asia and in Africa. It is said that in the sacred books of India there is clear evidence that cotton was in use for clothing purposes eight centuries before Christ.

The expedition of Alexander the Great from Persia into the Punjab was a good deal later, say, three hundred and thirty years before Christ. On the retreat down the Indus, Admiral Nearchus remarked "trees bearing as it were flocks or bunches of wool," of which the natives made "garments of surpassing whiteness, or else their black complexions make the material

whiter than any other." The Alexandrine general, Aristobulus, is more precise; he tells of a wool-bearing tree yielding a capsule that contains "seeds which were taken out, and that which remained was carded like wool." And long before Pliny referred to cotton in Egypt — "a shrub which men call 'gossypium,' and others 'xylon,' from which stuffs are made which we call xylina" — Strabo had noted the cultivation of the plant on the Persian Gulf.

At the beginning of the Christian era we find cotton in cultivation and in use in Persia, Arabia, and Egypt — but whether indigenous to these countries, or conveyed westward during the centuries from India, we know not. Thereafter, the westward spread was slow; but the plant is to be traced along the north coast of Africa to Morocco, which country it seems to have reached in the ninth century. The Moors took the plant, or seeds, to Spain, and it was being grown on the plains of Valencia in the tenth century; and by the thirteenth century it was, as we have said, growing in various parts of southern Europe.

Yet, although the Indian cloths were known to the Greeks and Romans a century or two before the Christian era, and although in the early centuries Arab traders brought to the Red Sea ports Indian calicoes, which were distributed in Europe, we find cotton known in England only as material for candle-wicks down to the seventeenth century. At any rate, M'Culloch is our authority for believing that the first mention of cotton being manufactured in England is in 1641; and that the "English cottons," of which earlier mention may be found, were really *woollens*.

And now we come to a very curious thing in the romance of cotton. Columbus discovered — or, as some say, rediscovered — America in 1492; and when he reached the islands of the Caribbean Sea, the natives who came off to barter with him brought, among other things, cotton yarn and thread. Vasco da Gama, a few years later than Bartholomew Diaz, in 1497 rounded the Cape of Good Hope and reached the Zanzibar coast. There the natives were found to be clothed in cotton, just as Columbus found the natives of Cuba to be, as Pizarro found the Peruvians, and as Cortes found the Mexicans. These Europeans, proceeding from the Iberian Peninsula east and west, found the peoples of the new worlds clothed with a material of which they knew nothing. Cotton was king in America, as in Asia, before it began even to be known in western Europe.

Not only that, but cotton must have been cultivated in Africa at the time when the mariners of Prince Henry the Navigator first made their way cautiously down the west coast. It is, at any rate, upwards of four hundred years since cotton cloth was brought from the coast of Guinea and sold in London as a strange, barbaric product. Whether the plant travelled to the Bight of Benin from the land of Prester John, or from the land of the Pharaohs, or across from the Mozambique coast, where the Arabians are supposed to have had settlements and trading-stations in prehistoric days, who can now say? But it is curious enough that when Africa was discovered by Europeans, the Dark Continent was actually producing both the fibre and the cloth for which African labor and English skill were afterwards to be needed. The cotton plantations of southern America were worked by the negroes of Africa in order that the cotton mills of Lancashire might be kept running. And yet both Africa and America made cotton cloth from the vegetable wool long before we knew of it otherwise than as a traveller's wonder.

Even in Asia, the natural habitat of the cotton plant, the story has been curious. Thus, according to the records above named, cotton has been in use for clothing for three thousand years in India, and India borders upon the ancient and extensive empire of China. Yet cotton was not used in China for cloth-making until the coming of the Tartars, and has been culti-

vated and manufactured there for only about five hundred years. This was because of the "vested interests" in wool and silk, which combined to keep out the vegetable wool from general use.

To understand aright the romance of cotton we must understand the nature of the plant in its relation to climate. It has been called a child of the tropics, and yet it grows well in other than tropical climes. As Mr. Richard Marsden — an authority on cotton-spinning — says: "Cotton is or can be grown [along] a broad zone extending forty-five degrees north to thirty-five degrees south of the equator. Reference to a map will show that this includes a space extending from the European shores of the Mediterranean to the Cape of Good Hope, from Japan to Melbourne in Australia, and from Washington in the United States to Buenos Ayres in South America, with all the lands intermediate between these several points. These include the Southern States of the American Union, from Washington to the Gulf of Mexico, and three-fourths of South America, the whole of the African Continent, and Southern Asia from the Bosphorus to Pekin in China. The vast area of Australia is also within the cotton zone, and the islands lying between that country and Asia."

The exact period at which the manufacture of cotton was begun in England is not known with absolute certainty. But as we have said, the first authentic mention of it occurs in 1641; and it is in a book called "Treasure of Traffic," by Lewis Roberts. The passage runs thus: "The town of Manchester, in Lancashire, must be also herein remembered, and worthily for their encouragement commended, who buy the yarne of the Irish in great quantity, and weaving it, returne the same again into Ireland to sell. Neither doth their industry rest here; for they buy *cotton wool* in London that comes first from Cyprus and Smyrna, and at home worke the same, and perfect it into fustians, vermilions, dimities, and other such stuffs; and then return it to London, where the same is vended and sold, and not seldom sent into foreign parts, who have means, at far easier terms, to provide themselves of the said first materials."

But here it should be explained that from the first introduction of the cotton fibre into this country, and until about the year 1773, in the manufacture of cloth it was only the weft that was of cotton. Down to about 1773, the warp was invariably of linen yarn, brought from Ireland and Germany. The Manchester merchants began in 1760 to employ the hand-loom weavers in the surrounding villages to make cloth according to prescribed patterns, and with the yarns supplied by the buyers. Thus they sent linen yarn for warp, and raw cotton — which the weaver had first to card and spin on a common distaff — for weft. Such was the practice when, in 1767, James Hargreaves of Blackburn inaugurated the textile revolution by inventing the spinning-jenny, which, from small beginnings, was soon made to spin thirty threads as easily as one. The thread thus spun, however, was still only available for weft, as the jenny could not turn out the yarn hard and firm enough for warp. The next stage, therefore, was the invention of a machine to give the requisite quality and tenuity to the threads spun from the raw cotton. This was the spinning-frame of Richard Arkwright, the story of which every schoolboy is supposed to know.

Here, then, we reach another point in our romance. The manufacture of cotton cloths in England from raw cotton is older than the cotton culture of North America. It is, in fact, only about one hundred years since we began to draw supplies of raw cotton from the Southern States, which, previous to 1784, did not export a single pound, and produced only a small quantity for domestic consumption. The story of the development of cotton-growing in America is quite as marvellous as the story of the expansion of cotton-manufacturing in England. In both cases the most stupendous extension ever reached by any single indus-

try in the history of the world has been reached in less than a hundred years.

And yet Columbus found the Cubans, as Pizarro found the Peruvians, and Cortes found the Mexicans, clothed in cotton. Was it from the same plant as now supplies "half the calico used by the entire human race" (as an American writer has computed)? This estimate, by the way, was arrived at thus: In 1889–90 the cotton crop of the world was 6,094 millions of pounds, and the population of the world was computed at fifteen hundred millions. This gave four pounds of raw cotton, equal to twenty yards of calico, per head; and the proportion of raw cotton provided by the Southern States was equal to eleven and a half yards per head.

There are several species of the cotton plant; but those of commercial importance are four in number. Herbaceous cotton (*Gossypium herbaceum*) is the plant which yields the East Indian "Surat" and some varieties of Egyptian cotton. Its habitats are India, China, Arabia, Egypt, and Asia Minor. It is an annual; it grows to a height of five or six feet, it has a yellow flower, and it yields a short staple. Tree cotton (*Gossypium arboreum*), on the other hand, grows to a height of fifteen or twenty feet, has a red flower, and yields a fine, silky wool. Its habitats are Egypt, Arabia, India, and China. Hairy cotton (*Gossypium hirsutum*) is a shrub of some six or seven feet high, with a white or straw-colored flower, and hairy pods, which yield the staple known as American "Upland" and "Orleans" cotton. Another variety, called *Gossypium Barbadense*, because it was first found in Barbadoes, grows to a height of about fifteen feet, and has a yellow flower, yielding a long staple, and fine, silky wool known as "Sea Island" cotton. This now grows most extensively on the coasts of Georgia and Florida; but has been experimented with in various parts of the world, notably in Egypt, where it has succeeded; and in the Polynesian islands, where, for some reason or other, it has failed.

The cotton plant of the American cotton plantations is an annual, which shoots above ground in about a fortnight after sowing, and which, as it grows, throws out flower-stalks, at the end of each of which develops a pod with fringed calyces. From this pod emerges a flower, which, in some of the American varieties of the general species, will change its color from day to day. The complete bloom flourishes for only twenty-four hours, at the end of which time the flower twists itself off, leaving a pod or boll, which grows to the size of a large filbert, browns and hardens like a nut, and then bursts, revealing the fibre or wool encased in three or four (according to the variety) cells within. This fibre or wool is the covering of the seeds, and in each cell will be as many separate fleeces as seeds, yet apparently forming one fleece.

Upon the characteristics of this fleece depends the commercial value of the fibre. The essential qualities of good and mature cotton are thus enumerated by an expert: "Length of fibre; smallness or fineness in diameter; evenness and smoothness; elasticity; tensile strength and color; hollowness or tube-like construction; natural twist; corrugated edges; and moisture." The fibre of Indian cotton is only about five-eighths of an inch long; that of Sea Island about two inches. Then Sea Island cotton is a sort of creamy-white color; and some kinds of American and Egyptian cotton are not white at all, but golden in hue; while other kinds, again, are snow-white.

Although the term "American cotton" is applied to all the cotton produced in the United States of America, it really applies to a number of different varieties — such as Texas, Mobile, Upland, Orleans, etc. — each one, known by its distinctive name. The differences are too technical for explanation here; but, generally speaking, the members of the *hirsutum* species of the *Gossypium* tribe now rule the world of cotton.

They are the product of what is

called the "cotton-belt" of the United States, an area stretching for about two thousand miles between its extreme points in the Southern States, which are North and South Carolina, Georgia, Alabama, Mississippi, Florida, Louisiana, Arkansas, and Texas. Over this area, soil and climate vary considerably. The "cotton-belt" lies, roughly speaking, between the thirtieth and fortieth parallels of north latitude. As an American expert says: "Cotton can be produced with various degrees of profit throughout the region bounded on the north by a line passing through Philadelphia; on the south by a line passing a little south of New Orleans; and on the west by a line passing through San Antonio. This is the limit of the possibilities."

The cotton plant likes a light, sandy soil, or a black, alluvial soil like that of the Mississippi margins. It requires both heat and moisture in due proportions, and is sensitive to cold, to drought, and to excessive moisture. The American cotton-fields are still worked by negroes, but no longer slaves, as before the war; and, in fact, the negroes are now not only free, but some of them are considerable cotton-growers on their own account. On the other hand, one finds nowadays little of the old system of spacious plantations under one ownership. Instead, the cultivation is carried on on small farms and allotments, not owned but rented by the cultivators. Large numbers of these cotton farmers are "financed" by dealers, by landowners, or even by local store-keepers.

The cotton factor is the go-between of the grower and the exporting agent in Galveston or New Orleans, or other centre of business. After the crop is picked by the negroes — men, women, and children — and the harvest is a long process — the seeds are separated from the fibre by means of a "gin;" and then the cotton-wool is packed into loose bales for the factor, while the seeds are sent to a mill to be crushed for cotton-seed oil and oil-cake for cattle-feeding. The loose cotton bales are collected by the factor into some such central town as Memphis, where they are sorted, sampled, graded, and then compressed by machinery into bales of about four hundred and forty pounds each, for export. (In calculating crops, etc., a bale is taken as four hundred pounds net.)

The cotton then passes into the hands of the shipping agent, who brands it, and forwards it by river-steamer to one of the southern ports, or by rail to New York or Boston, where it is put on board an ocean steamer for Europe. The beautiful American clippers with which some of us were familiar in the days of our youth are no longer to be seen; they have been run off the face of the waters by the "ocean-liner" and the "tramp." Arrived in Liverpool, or long before it arrives in Liverpool, cotton enters upon a new course of adventures altogether, and engages the thoughts and energies of a wholly new set of people. Something of this part of the romance of cotton has been given by Mr. J. Maclaren Cobban in a recent story, and for the present we need not follow it further.

STEAMERS OF THE AFRICAN LAKES. — Besides the steamboats constructed by the "African Lakes Company," there are boats belonging to the "Zambesi Traffic Company," the "African International Flotilla Company," plying on the lakes and on the Zambesi River for trade. If the proposed railway from Zanzibar towards Uganda is ever completed, the slave trade will die away. "The Arabs," says Mr. Commissioner Johnston, "I am happy to say, are a waning force, and will soon cease to be a factor in Central African politics, at any rate so far as British Africa is concerned."